



B Informatica | M Computing Science
University of Groningen

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www.academion.nl
info@academion.nl

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Summary

Standard 1. Intended learning outcomes

The panel concludes that both the bachelor and master in Computing Science at the University of Groningen are clearly and coherently positioned as academically demanding programmes that balance research orientation with professional applicability. At bachelor level, the programme offers a broad foundation with well-defined choices in scope, preparing students both for advanced study and for professional roles requiring solid disciplinary grounding. The master's programme builds on this foundation by offering multiple specialized tracks, integrating research into coursework, and equipping students for doctoral study or high-level professional positions. In both cases, the intended learning outcomes are appropriately formulated, benchmarked against ACM/IEEE standards, and demonstrably aligned with the Dublin descriptors at NLQF levels 6 and 7 respectively. The panel appreciates the structured involvement of the professional field, particularly through the External Advisory Panel, which ensures that both programmes remain attuned to societal and labour market needs. Finally, the panel advises updating the intended learning outcomes of both programmes to explicitly address Generative AI. Students should not only acquire foundational knowledge and practical competences related to GenAI technologies but also learn to critically evaluate their societal, ethical, and methodological implications. Embedding this dual perspective will strengthen the programmes' alignment with current developments in computing science and its broader impact on research and professional practice.

Standard 2. Teaching-learning environment

The panel considers the curriculum of both the bachelor and the master in Computing Science to be well designed, coherent, and aligned with the intended learning outcomes. The bachelor programme balances a broad academic foundation with thematic depth in Systems and Data, complemented by a structured progression from compulsory courses to more free space, internships, and the final project. The master offers research-oriented specialization through four tracks and course packages, ensuring both depth and flexibility. The panel appreciates the integration of ethics throughout the curricula, but advises making the role of ethics more explicit in the master's programme.

Admission to both programmes is well organized. The premaster of 30 EC provides a smooth transition for students from universities of applied sciences, by enabling them to incorporate these courses into their present programme, which the panel values highly. The feasibility of the programmes is well safeguarded. Students benefit from a strong mentor system, approachable staff, and clear guidance structures, though the panel suggests revisiting workload distribution in the master.

Both programmes are taught in English, a choice the panel fully endorses given the international nature of the field and the employability benefits. The English language of instruction is well supported by the staff's proven language competence. The teaching staff is highly qualified, research-active, and diverse, with particular attention to gender balance and inclusion. The panel recommends monitoring career progression for staff on teaching tracks and ensuring that full professors remain sufficiently visible in the bachelor. Maintaining close relationships with companies for internships and projects is essential, particularly in light of increasing student numbers. This task, however, now adds considerably to staff workload. The panel advises to reflect on measures to increase support for this task. Finally, programme-specific facilities are strong and well aligned with research themes, enabling students to work in realistic, computing-intensive environments. The panel notes that future investments may be required in cloud-based environments and GPUs to keep pace with technological developments.

Standard 3. Student assessment

The panel concludes that the assessment systems of both the bachelor and the master in Computing Science are robust, varied, and transparent. The combination of written exams, programming assignments, projects, and oral presentations ensures that a broad range of competences is assessed in a fair and structured way. Instruments such as rubrics and the Themis automated system contribute to transparency, comparability, and timely feedback. The panel finds the thesis assessment procedures particularly strong, with clear rubrics, and structured feedback contributing to reliability. The panel also commends the balanced approach to Generative AI, noting that assessment methods have been thoughtfully adapted to preserve integrity while encouraging students to engage critically and responsibly with emerging technologies. At the same time, the panel sees scope for refinement. In the master's programme, the role of ethics in assessment should be made more explicit, and the assessment of soft skills in the internship could be better differentiated between the bachelor and master programme.

The panel also finds that the Board of Examiners (BoE) plays a vital role in safeguarding assessment quality. To further strengthen its work, the panel advises the BoE to formalize a procedure for examiner disagreements and guarantee independence between first and second examiners. Finally, in the light of the currently high cum laude percentages, the panel advises to consider more stringent grading guidelines to ensure consistency and to maintain the exceptional character of the cum laude distinction.

Standard 4. Achieved learning outcomes

The panel concludes that the bachelor and master programmes in Computing Science deliver graduates of a high calibre. The theses reviewed clearly demonstrate that students acquire strong academic and research skills, with several bachelor projects even exceeding the expected level for undergraduate study. The occurrence of bachelor theses leading to publications is exceptional and illustrates the research-oriented profile of the programme. At master's level, the panel observed well-executed projects that combine academic rigour with practical relevance, often presenting experimental results or addressing external use cases. This balance between scholarly quality and applicability confirms that graduates are well prepared for both doctoral research and demanding professional roles.

Graduate outcomes reinforce this conclusion. The bachelor's programme enables multiple pathways, with many students continuing to master's studies while others successfully enter the labour market. The master's programme shows particularly strong employability, with most graduates securing positions shortly after graduation.

Score table

The panel assesses the programmes as follows:

Bachelor Computing Science

Standard 1: Intended learning outcomes	meets the standard
Standard 2: Teaching-learning environment	meets the standard
Standard 3: Student assessment	meets the standard
Standard 4: Achieved learning outcomes	meets the standard
General conclusion	positive

Master Computing Science

Standard 1: Intended learning outcomes	meets the standard
Standard 2: Teaching-learning environment	meets the standard
Standard 3: Student assessment	meets the standard
Standard 4: Achieved learning outcomes	meets the standard
General conclusion	positive

The assessment panel has reviewed the report and agrees with its contents. On behalf of the panel,

Prof. dr. B. (Bart) Preneel [Chair]
Date: 7 December 2025

Y. (Yannick) Slagter MA [secretary]

Introduction

Procedure

Assessment

On 29 and 30 September 2025, the bachelor Informatica (which will be referred to by the international name Computing Science or CS in short in the remainder of this report) of the University of Groningen were assessed by an independent peer review panel as part of the cluster assessment Computer Science. The assessment cluster consisted of 25 programmes, offered by the institutions Open Universiteit, University of Groningen, University of Twente, Vrije Universiteit Amsterdam, University of Amsterdam, Maastricht University, Radboud University, Erasmus University Rotterdam, Eindhoven University of Technology, Delft University of Technology and the University of Utrecht. The assessment followed the procedure and standards of the NVAO Assessment Framework for the Higher Education Accreditation System of the Netherlands (April 2024).

Quality assurance agency Academion coordinated the assessment upon request of the Computer Science cluster. Yannick Slagter and Peter Hildering acted as coordinator in the cluster assessment and Yannick Slagter acted as secretary for the assessment of the programmes of the University of Groningen. They have been certified and registered by the NVAO.

Panel composition

Academion composed the peer review panel in cooperation with the institutions and taking into account the expertise and independence of the members. In order to strengthen the mutual consistency between the assessment panels within the cluster, the coordinator from Academion ensured joint instruction for the panel members and a comparable assessment method for all site visits. This consistency was also a point of attention at all concluding panel meetings during the site visits. Finally, overlap in assessment panels of the various site visits in the cluster further strengthened the consistency. The composition of the panels was designed in such a way that at least one panel member also participated in another assessment panel in the cluster.

On 30 April 2025 the NVAO approved the composition of the panel. The coordinator instructed the panel chairs on their role in the site visit according to the Panel chair profile (NVAO 2016) on 9 December 2024.

Preparation

The programmes composed a site visit schedule in consultation with the coordinator (see appendix 3). The programmes selected representative partners for the various interviews. They also determined that the development dialogue would be made part of the site visit. A separate development report was made based on this dialogue.

The programmes provided the secretary with a list of graduates over the period 2022 - 2024. In consultation with the secretary, the panel chair selected 15 theses per programme. They took the diversity of final grades and examiners into account, as well as the various tracks. For the master's programme, they selected 7 theses of the Data Science and Systems Complexity track, 3 theses of the Intelligent Systems and Visual Computing track, 1 thesis of the Science Business and Policy track and 4 theses of the Software Engineering & Distributed Systems track. This selection reflected the number of graduates in each particular track proportionally.

Prior to the site visit, the programmes provided the panel with the theses and the accompanying assessment forms. They also provided the panel with the self evaluation report and additional materials (see appendix 4).

The panel members studied the information and sent their findings to the secretary. The secretary collected the panel's questions and remarks in a document and shared this with the panel members. In a preliminary meeting, the panel discussed the initial findings on the self-evaluation reports and the theses, as well as the division of tasks during the site visit. The panel was also informed on the assessment frameworks, the working method and the planning of the site visits and reports.

Site visit

During the site visit, the panel interviewed various programme representatives (see appendix 3). The panel also offered students and staff members an opportunity for confidential discussion during a consultation hour. One student requested a consultation. The panel used the final part of the site visit to discuss its findings in an internal meeting. Afterwards, the panel chair publicly presented the preliminary findings, general observations of the panel and suggestions for development themes.

Report

The secretary wrote a draft report based on the panel's findings and submitted it to an Academion colleague for peer assessment. Subsequently, the secretary sent the report to the panel for feedback. After processing this feedback, the secretary sent the draft report to the programme in order to have it checked for factual irregularities. The secretary discussed the ensuing comments with the panel chair and changes were implemented accordingly. The panel then finalized the report, and the coordinator sent it to the Faculty of Science and Engineering at the University of Groningen.

Panel

The panel assessing the bachelor's and master's programme in Computing Science at the University of Groningen consisted of the following members:

- Prof. Dr. B. (Bart) Preneel, Full Professor Computer Security and Industrial Cryptography at the Faculty of Engineering Sciences at the KU Leuven [Chair];
- Prof. dr. E. (Elisabetta) Di Nitto, Full Professor of the Dipartimento di Elettronica, Informazione e Bioingegneria of Politecnico di Milano;
- Prof. dr. P. (Paola) Grosso, Full Professor Multiscale Networks at the Faculty of Natural Sciences, Mathematics, and Computational Sciences at the University of Amsterdam;
- Prof. dr. M. (Marco) Aiello, Full professor of Service Computing at the University of Stuttgart;
- Em. prof. dr. ir. F. (Farhad) Arbab, Emeritus Professor Software Composition at the University of Leiden.
- I. (Imane) el Caïdi BSc, Master student Computer Science (track Algorithmic Design and Analysis & Operations Research) at the University of Utrecht. [Student member]

Each panel member, the panel secretary and the programmes have filled out the Statement of Impartiality and non-disclosure agreement, as required by the NVAO. They can confirm that the assessment was carried out in complete independence.

Information on the programmes

Name of the institution:	Rijksuniversiteit Groningen
Address:	Broerstraat 5, 9712 CP Groningen
Website:	www.rug.nl
BRIN-number:	21PC
Status of the institution:	Publicly funded institution
Result institutional quality assurance assessment:	Positive

Programme name:	B Informatica
ISAT number:	56978
Orientation of the programme:	Academic
Level of the programme:	Bachelor (NLQF 6)
Number of credits:	180 EC
Language of instruction:	English
Professional requirements:	no
Location:	Groningen
Mode(s) of study:	Fulltime
Assessment group:	Informatica
Awarded degree:	BSc
Submission date NVAO:	1 May 2026

Programme name:	M Computing Science
ISAT number:	60364
Orientation of the programme:	Academic
Level of the programme:	Master (NLQF 7)
Number of credits:	120 EC
Language of instruction:	English
Professional requirements:	no
Specializations or tracks:	Machine Learning and Visual Computing AI Engineering Software Engineering and Distributed Systems Science Business and Policy
Location:	Groningen
Mode(s) of study:	Fulltime
Assessment group:	Informatica
Awarded degree:	MSc
Submission date NVAO:	1 May 2026

Description of the assessment

Organization

The bachelor and master programmes in Computing Science are embedded within the Faculty of Science and Engineering (FSE) of the University of Groningen (UG). FSE is one of the university's largest faculties, combining a broad spectrum of disciplines across the natural sciences, engineering, and information technology. Both programmes are housed in the Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence, which provides the academic and organizational home for education and research in these fields. Day-to-day management of the programmes lies with the programme director, who is responsible for curriculum development, quality assurance, and coordination with the Faculty Board. Programme directors are supported by programme coordinators in these tasks, and have access to support staff in various activities. They work closely with the Board of Examiners, the Faculty's educational support office, and the Programme Committees (OLCs), in which students and staff collaborate to enhance teaching quality. The Faculty Board holds ultimate responsibility for the quality of all education and research within the faculty.

The master's track Science, Business and Policy (SBP) is a faculty-wide specialization, with participating students from multiple master's programmes in the faculty. SBP was considered during the accreditation of the master's programme Biology (ISAT 66860) in 2021. This report, therefore, only considers the Computing Science part of this specialization, and not the specialization-specific content.

Recommendations previous panel

In the previous accreditation cycle, both the bachelor and master programmes in Computing Science were positively assessed and fully accredited. The panel at that time praised the strong academic foundation, research integration, and student satisfaction in both programmes. Several recommendations were made for further improvement. The panel recommended making the intended learning outcomes more distinctive by emphasizing the theoretical and research focus of the programmes. Furthermore, the visibility of the skills training learning line should be increased, and interaction with the professional field strengthened. The panel also recommended improving alignment between courses and communicating more clearly to students how course evaluations lead to improvements. In addition, continuous attention was advised regarding the relationship between student numbers, staff capacity, and available facilities. Finally, the panel encouraged establishing a more explicit link between assessment methods and intended learning outcomes at the course level. The current panel finds that these recommendations have been addressed systematically and that clear progress has been made across all five areas.

Standard 1. Intended learning outcomes

The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.

Findings

Bachelor Computing Science

The bachelor programme in Computing Science at the University of Groningen is positioned as a broad, research-driven academic programme situated within a general university rather than an engineering university. This positioning provides a distinctive balance between theoretical underpinnings and applied elements of the field, in line with the Faculty of Science and Engineering's profile of combining natural

sciences with engineering. The bachelor's programme aims to provide students with a comprehensive foundation in computer science, including both core knowledge areas and the development of transferable skills necessary for further study or professional practice.

The intended learning outcomes (ILOs) of the programme are defined in three overarching domains:

1. Knowledge – graduates acquire understanding of fundamental computer science principles, theories, methods, and sub-disciplines. The curriculum ensures coverage across the breadth of the ACM Computing Classification System, including areas such as algorithms, distributed systems, information systems, and computer architecture.
2. Skills – graduates are expected to develop technical skills (e.g. programming, systems design), academic and research skills (formulating research questions, engaging with scientific literature, applying methodologies), and professional skills (teamwork, communication, intercultural collaboration).
3. Attitude – students are prepared for professional and ethical conduct, including awareness of societal implications of computing technologies.

The ILOs are aligned with the Dublin Descriptors at bachelor level. The programme emphasizes knowledge and understanding, the application of knowledge to solve problems, the ability to gather and interpret relevant data, communication skills, and the development of learning strategies for continued study. The bachelor is explicitly benchmarked at Dutch NLQF level 6 (Bachelor).

In addition, the programme maintains alignment with the international ACM/IEEE curriculum guidelines for computer science education. The introduction of defined 'learning lines' ensures that the full set of knowledge areas and competencies prescribed by the ACM/IEEE standards are systematically addressed throughout the curriculum. The research groups in the Bernoulli Institute provide additional coherence between research and teaching, further strengthening the research orientation of the programme.

The panel finds that the intended learning outcomes of the bachelor Computing Science are well-formulated and of appropriate academic level, fully aligned with NLQF level 6 and the Dublin descriptors, as well as with the international ACM/IEEE curriculum guidelines for computer science education. The programme positions itself clearly between academia and industry: it provides a broad and solid foundation across core domains of computing science, while at the same time preparing students for progression into specialized master's programmes or professional positions. The panel appreciates that the programme makes conscious choices about its profile, by choosing 'systems' and 'data' as the core themes of the programme and by not covering every possible subfield such as quantum computing or cybersecurity, which strengthens its coherence. The intended learning outcomes therefore reflect both a strong research orientation and professional applicability. To ensure continued relevance in a rapidly developing field, the panel advises updating the learning outcomes to explicitly include Generative AI, reflecting its growing academic and societal significance. Students should not only acquire fundamental knowledge and practical skills related to GenAI technologies but also develop the ability to critically assess their implications, limitations, and ethical impact.

Master Computing Science

The master programme in Computing Science builds directly upon the foundations laid in the bachelor's programme, but is clearly distinguished in its scope, depth, and academic orientation. The master is structured as a two-year programme offering multiple tracks, each of which allows for both depth in specialized areas and the development of advanced research skills. Its positioning is that of a

comprehensive, research-oriented academic programme with strong connections to both theoretical and applied aspects of computing science.

The ILOs of the MSc programme build on three domains:

1. **Advanced Knowledge** – graduates demonstrate an in-depth and critical understanding of specialized areas within computer science. These include software engineering, machine learning, visual computing, AI engineering, and cybersecurity, as well as more theoretical domains. The master goes beyond the bachelor level by requiring students to integrate and critically assess advanced scientific literature, frameworks, and methodologies.
2. **Skills** – graduates develop advanced research competencies, including the capacity to design and conduct independent research projects, evaluate and replicate existing studies, and contribute to ongoing scholarly debates. In addition, they acquire professional skills relevant to collaborative research and innovation, as well as communication skills for both academic and applied contexts.
3. **Attitude** – students are expected to develop independence, critical reflection, and professional responsibility, including awareness of ethical and societal aspects of computing science.

The ILOs are aligned with the Dublin Descriptors for the master level, ensuring that graduates achieve NLQF level 7. This includes the ability to integrate knowledge, handle complexity, make judgements with incomplete information, and communicate conclusions clearly to both specialist and non-specialist audiences. Moreover, the master ILOs prepare students for doctoral studies or high-level professional roles where innovation and independent problem-solving are required.

Internationally, the programme benchmarks its outcomes against the ACM/IEEE curriculum standards for graduate computing education. Through the track and course package structure, the MSc programme guarantees both depth in specific sub-disciplines and breadth across the main knowledge domains of the field. The incorporation of active research components in courses, such as replication studies and critical analysis of recent papers, further highlights its research-driven orientation.

The panel concludes that the intended learning outcomes of the master in Computing Science are clear and meet the standards of NLQF level 7, with a good balance between research orientation and professional applicability. They are also aligned with the international ACM/IEEE curriculum guidelines for computer science education. Graduates of the master's are equipped not only with specialized expertise in their chosen track but also with transferable skills for research, industry, and policy-related contexts. The panel notes that, due to Groningen's geographical location, the programme is somewhat distant from the main clusters of academic and industrial activity in the Netherlands. The panel considers the programme's international orientation and appeal to be strong, and therefore does not regard the relatively limited number of Dutch students as a concern. The learning outcomes are both academically robust and well aligned with professional expectations. As with the bachelor's programme, the panel advises that the outcomes be revised to explicitly incorporate Generative AI, ensuring alignment with the state of the art in computing science and its societal impact.

Alignment with professional field

Both the BSc and MSc programmes maintain a structured relationship with the professional field through the External Advisory Panel (EAP). This panel consists of representatives from industry, research institutes, and public organizations, including national and regional companies, such as BelSimpel/Gomibo, Aegon, governmental bodies (Kadaster), applied research organizations (TNO), and educational institutions (e.g. Hanze University of Applied Sciences). The EAP is chaired by an experienced external professional with a strong background in ICT and business innovation.

The EAP convenes annually with the daily management team of the Computing Science programmes and the management of the Computer Science department. Its role is to ensure that the intended learning outcomes remain aligned with developments in the professional and academic fields. The panel provides input on the relevance of technical knowledge areas (such as cybersecurity, data science, and AI engineering), as well as on the importance of transferable competences such as teamwork, communication, and professional conduct. The feedback of the EAP directly informs curriculum design and review, and ensures that both programmes remain connected to the evolving requirements of the labour market and society. The inclusion of professional skills within the ILOs, as well as the explicit recognition of English as the working language in most graduate employment contexts and therefore choosing English as the language of instruction, reflect this dialogue.

The panel is satisfied that both programmes maintain a strong and structured relationship with the professional field, ensuring that intended learning outcomes remain relevant and responsive to societal and industry needs. This is achieved primarily through the active involvement of the EAP, which convenes regularly – sometimes even twice a year, as became clear from the interview with members of the EAP during the site visit – to provide input on curricular developments and emerging trends. The panel values not only the functioning of the EAP but also the way its recommendations are actively taken up by the department and embedded in programme development. This structured interaction ensures that the programmes retain their academic and research orientation while maintaining close links with professional practice. As a further point of attention, the panel encourages the programmes to use the External Advisory Panel's expertise also in the context of outreach and marketing, particularly to strengthen the inflow into the master's programme.

Considerations

The panel concludes that both the bachelor and master in Computing Science at the University of Groningen are clearly and coherently positioned as academically demanding programmes that balance research orientation with professional applicability. At bachelor level, the programme offers a broad foundation with well-defined choices in scope, preparing students both for advanced study and for professional roles requiring solid disciplinary grounding. The master's programme builds on this foundation by offering multiple specialized tracks, integrating research into coursework, and equipping students for doctoral study or high-level professional positions. In both cases, the intended learning outcomes are appropriately formulated, benchmarked against ACM/IEEE standards, and demonstrably aligned with the Dublin descriptors at NLQF levels 6 and 7 respectively. The panel appreciates the structured involvement of the professional field, particularly through the External Advisory Panel, which ensures that both programmes remain attuned to societal and labour market needs. Finally, the panel advises updating the intended learning outcomes of both programmes to explicitly address Generative AI. Students should not only acquire foundational knowledge and practical competences related to GenAI technologies but also learn to critically evaluate their societal, ethical, and methodological implications. Embedding this dual perspective will strengthen the programmes' alignment with current developments in computing science and its broader impact on research and professional practice.

Conclusion

The panel concludes that the programmes meet standard 1.

Standard 2. Teaching-learning environment

The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.

Findings

Curriculum Bachelor CS

The bachelor's programme in Computing Science is structured as a coherent, three-year trajectory that combines foundational courses in computer science with a gradual development of more advanced knowledge and skills. The curriculum is organized around two overarching themes – Systems and Data – alongside a substantial core programme. The core comprises fundamental topics such as programming, software engineering, algorithms, and theoretical foundations, with the themes providing focus and progression across the programme. To ensure systematic and comprehensive coverage of the discipline, the bachelor's curriculum is structured around a set of well-defined learning lines that organise teaching and learning around recurring themes of knowledge and skill development. These learning lines – Computation and Complexity, Computer Architecture and Organization, Discrete Structures, Distributed Systems, Graphics and Visualization, Information Management, Information Security and Privacy, Intelligent Systems, Programming, and Software Engineering – each integrate related ACM/IEEE knowledge areas, such as algorithms, systems fundamentals, programming languages, and human-computer interaction. Together, they provide a coherent framework that ensures that every major knowledge area is addressed in at least one part of the curriculum, avoiding both unnecessary overlap and omission.

In the first year, students acquire the core foundations of computing science, including algorithms and data structures, computer architecture, logic, mathematics (calculus, linear algebra, probability and statistics), and introductory courses in programming and information systems. These courses collectively establish the conceptual and technical basis upon which later learning is built. Importantly, the curriculum includes a dedicated 'Introduction to Computing Science' course that familiarizes students with the academic nature of the discipline and the expectations of a research university context.

The second year deepens knowledge and introduces more applied perspectives. Courses such as Operating Systems, Databases, Machine Learning, and Web Engineering connect theory to practice, while Advanced Programming and Software Engineering provide students with the skills to work on larger codebases and collaborative projects. The inclusion of a course on research skills ensures that students begin to develop academic competencies, such as critical engagement with scientific literature, research design, and data analysis. These skills are necessary for the bachelor's project in the final year.

The third year provides flexibility and further specialization. Students can choose 30 EC of elective courses within a structured minor space, allowing them to explore subfields such as distributed systems, compiler construction, computer graphics, or information security. Since 2025-2026, a 5 or 15 EC internship option is available as part of these electives, providing students with the opportunity to gain professional experience. The curriculum concludes with a 15 EC bachelor's project, in which students must demonstrate their ability to apply acquired knowledge and skills to a substantial research or development assignment, often in relation to one of the research groups in the Bernoulli Institute.

Teaching in the bachelor's programme combines traditional and modern didactic approaches, ensuring an active and engaging learning experience. Students are taught through a balanced mix of lectures, tutorials, computer labs, and group projects, complemented by blended learning methods that integrate online and in-person components. Courses such as Algorithms and Data Structures and Fundamentals of Distributed Systems include practical lab work to strengthen problem-solving and programming skills. Group work features prominently in courses such as Web Engineering and Software Engineering, promoting collaboration and communication. From the Research Skills in Computing Science course onwards, students gradually transition toward independent academic inquiry, learning to formulate research questions,

conduct literature reviews, and design small-scale projects – skills that culminate in the final bachelor's thesis.

The panel concludes that the bachelor curriculum strikes an effective balance between breadth and depth. Its structure with a broad core programme complemented by the Systems and Data themes ensures that students encounter a wide range of topics in a progressive and reinforcing manner. The panel also appreciates the clear organisation of the curriculum through well-defined learning lines that systematically cover the ACM/IEEE knowledge areas and contribute to the programme's internal coherence. Electives including the optional internship provide additional flexibility, allowing students to develop their own profiles and prepare for diverse career or study pathways. The curriculum is clearly oriented towards both research and professional practice, culminating in the research-oriented final project. The panel particularly values the programme's structured pedagogical approach: students first follow a highly structured set of mandatory courses before gradually gaining more flexibility later in their studies. Students confirmed that this structure allows them to adapt to academic expectations at university level, while progressively taking greater responsibility for their own study choices. The panel sees this as a well-balanced approach, combining academic rigour with student autonomy.

The panel also appreciates the integration of ethics within the curriculum. Previously offered as a stand-alone course, ethics is now embedded into existing courses such as Software Engineering and Research Skills. Students reported that the former separate course felt disconnected, whereas the new approach makes ethics more relevant by situating it in the context of concrete projects. The panel agrees that this strengthens students' ability to apply ethical reflection in practice. Overall, the curriculum is well-structured, academically demanding, and appropriately designed for a university-level bachelor's degree. It offers a coherent progression from foundational knowledge to advanced applications and supports students in developing both disciplinary expertise and academic skills.

Curriculum Master CS

The master in Computing Science is a two-year programme that builds upon the bachelor's foundation by offering advanced and research-oriented education in computer science. The curriculum is structured around four tracks, three of which are closely linked to the themes of the bachelor programme:

- **Software Engineering and Distributed Systems (SEDS)**, aligned with the Systems theme;
- **Machine Learning and Visual Computing (MLVC)**, aligned with the Data theme;
- **AI Engineering**, combining both the Data and Systems themes;
- **Science, Business and Policy (SBP)**, a faculty-wide track with distinct objectives.

This track structure enables students to pursue in-depth study in specialized subfields while ensuring that a common academic standard is maintained across the programme. Furthermore, each track offers multiple course packages that allow students to specialize further. These course packages are on topics such as theoretical computing science, cybersecurity, applied data science, machine learning theory and engineering of AI systems.

During the first year, students take a defined set of track-specific course packages (30 EC, of which 20 EC course package specific) alongside 30 EC worth of electives of relevant master's courses: there are pre-approved electives from other tracks, or students can take electives from relevant master's programmes, though this needs to be approved by the Board of Examiners. This structure ensures both depth and interdisciplinary breadth. For instance, within the SEDS track, students engage with courses such as Cloud Computing, Software Analytics, and Advanced Distributed Systems, while the MLVC track focuses on data

science, pattern recognition, and advanced computer graphics. The AI Engineering track combines machine learning with systems engineering perspectives, preparing students for the development and deployment of trustworthy AI systems. The SBP track is distinct in its organization and aims. Offered at faculty level, it focuses on developing skills and knowledge for careers as science communicators, policy advisors, or entrepreneurs. Its learning objectives differ from the research-intensive CS tracks. However, students in SBP are required to take one course package from the Computing Science tracks, ensuring that they acquire the necessary CS knowledge alongside their policy or business training.

The curriculum also incorporates core academic and professional components. All students participate in a student colloquium that provides training in presentation, scientific communication, and engagement with current research. An Internship (15 EC), either a research internship in an academic setting or in-company in an industry setting, allows students to gain hands-on experience in a professional or research environment, while the 30 EC master's thesis serves as the capstone of the programme. The thesis requires students to independently design, conduct, and present a research project at a level commensurate with international standards for master's education.

The master's programme employs a varied and research-driven didactic concept, combining lectures, seminars, and practical labs with project-based and collaborative learning. Many courses integrate recent research findings, requiring students to replicate, critique, or extend published studies. Group-based assignments and research projects in courses such as Machine Learning Systems Deployment and Operations and Enterprise Application Integration strengthen teamwork and technical proficiency. Practical work in computer labs and project environments reinforces theoretical learning with applied experience. The emphasis on independent research increases throughout the programme, particularly through the Student Colloquium, the internship, and the final thesis, where students demonstrate their ability to conduct and present original research at an advanced academic level.

The panel finds the MSc curriculum to be explicitly research-oriented, with courses frequently integrating recent research developments, requiring students to replicate or critique scientific work and apply advanced methodologies. This prepares graduates for high-level positions in industry and applied research as well as doctoral research. Through the student colloquium and the research internship, the panel now also sees more of an industry focus, which they find very valuable. The panel appreciates that the curriculum is characterized by a rich variety of specializations. Students can choose among four tracks, each of which offers further differentiation through course packages. The panel appreciates this diversity, which enables students to tailor their studies closely to their interests and future plans. It also acknowledges that maintaining a broad portfolio of courses is demanding for a relatively small programme but finds this justified given Groningen's geographical position, which limits students' access to interuniversity mobility compared to other regions in the Netherlands. The panel highlights specific strengths: Software Engineering and Distributed Systems is seen as a track with strong potential for growth, while the Theoretical Computer Science package is considered highly relevant in the context of Generative AI, since it addresses foundational aspects unlikely to be disrupted by such tools. The topic of ethics is present across courses, though not always visible to students. While embedding ethical reflection in technical courses is valuable, the panel suggests that its presence be communicated more explicitly. Students expressed uncertainty about where ethics is addressed, which the panel believes could be remedied through clearer articulation in course descriptions and learning outcomes. In summary, the MSc curriculum combines academic depth, research orientation, and flexibility, ensuring that graduates develop both specialized expertise and transferable skills.

Admission

Admission to the bachelor CS is open to students with a Dutch pre-university diploma (vwo) with the appropriate subject combination, typically profiles that include mathematics B. International students are admitted on the basis of equivalent qualifications, assessed by the Admissions Office. Prospective students participate in a mandatory matching procedure designed to ensure informed choice and commitment. This activity familiarizes applicants with the academic expectations and the specific profile of Computing Science at Groningen. Intake has been around circa 120-150 students in recent years, with a marked increase in international students (about 70% of the student population). The student population is diverse in terms of cultural and educational backgrounds, though the proportion of female students remains relatively low, mirroring broader patterns in the discipline. The programme provides information and guidance during orientation to ease the transition for students from different systems.

The master CS admits students with a bachelor's degree in Computing Science from the University of Groningen or equivalent qualifications from other universities. Applicants with related backgrounds (e.g. mathematics, AI, or engineering) may be admitted provided they demonstrate sufficient computer science knowledge; otherwise, a tailored premaster programme can be required. The admissions procedure is managed by a faculty committee that reviews prior coursework, academic performance, and motivation. The master has circa 110 students enrolled, with an influx of around 40 students each year and a sizeable and growing international intake, representing a broad range of countries. This diversity enriches the classroom environment but also brings challenges regarding variation in prior knowledge and programming experience. To address this, the programme provides information about entry requirements and offers guidance to help students adapt to the expectations of a research-intensive master.

The panel finds that the admission procedures for both the bachelor and the master in Computing Science are clear, appropriate, and well aligned with national and faculty-wide regulations. The bachelor admission route ensures that incoming students meet the required academic prerequisites, while the master's programme offers a fixed 30 EC pre-master for HBO ICT students or a tailormade pre-master track to facilitate entry for students with deficiencies in theoretical background or skills. Retention from the bachelor into the Groningen master remains modest; the panel advises the programmes to strengthen this inflow in light of the master's growth ambitions. The panel values that students from Hanze University of Applied Sciences and NHL Stenden can integrate this pre-master into their four-year bachelor trajectory, allowing them to progress seamlessly without losing an additional study year.

Language and programme name

Both the bachelor and master programmes in Computing Science at the UG are fully taught in English. The choice of English as the language of instruction is deliberate and aligned with the international orientation of the field. Computing science is a global discipline in which English is the dominant academic and professional language. By offering the programmes in English, students are trained to engage with international research literature, to participate in global scientific debates, and to operate effectively in multinational professional environments. This language policy also broadens the programmes' appeal to international students, thereby fostering a diverse and multicultural classroom environment. This enhances peer learning and intercultural collaboration, which are explicitly valued in the intended learning outcomes. The teaching staff are fully capable of teaching in English, as this is the standard working language of the institute. Staff members are supported through training and language development opportunities to ensure consistent quality in English-medium instruction.

The choice of the programme name, Computing Science, reflects both international convention and disciplinary accuracy. While 'Computer Science' is more widely used in Anglo-American contexts, the term

Computing Science is historically rooted in the Groningen context and emphasizes the scientific study of computation in a broad sense, including theoretical, methodological, and applied aspects.

The panel finds that the choice of English as the language of instruction in both the bachelor and master Computing Science is well justified and fully appropriate. In view of the international dimension (cf. supra), the panel notes that most scientific literature and textbooks are no longer available in Dutch, while representatives from the professional field also emphasised that English is essential for employability. Students confirmed this view: one Dutch bachelor student explained that he specifically chose this programme because of its English-medium instruction, which he considered an asset for his future career. The panel therefore fully supports the decision to offer both programmes in English, with an internationally recognizable programme name.

Feasibility and Guidance

The bachelor CS provides a comprehensive set of facilities and support mechanisms to promote student progress and well-being. Guidance begins early in the programme: during the first six months, all first-year students participate in a mentoring scheme led by senior students. This initiative is designed not only to ease the academic transition, but also to foster social integration – an important factor given the strong international composition of the cohorts (approximately 70% international students). Community-building is further supported through activities organized by the study association Cover and by the programme itself, ensuring that students feel connected despite the relatively large size of the cohort.

Formal academic advising plays a central role. Dedicated academic advisors are available through e-mail, weekly office hours, and individual appointments. They provide assistance with personal as well as study-related matters and actively reach out to students in the case of delays or irregular study progress. Guidance becomes especially intensive during the third year, when students are required to select a minor programme. Because every individual study plan must be approved by the Board of Examiners, advisors ensure that students receive personalized support to make well-informed and feasible choices. Students who opt for the elective internship receive additional guidance. They can choose between a research internship within one of the university's research groups or an external placement with a company. In both cases, supervision is shared between an academic supervisor and, where relevant, an in-company supervisor. Students are responsible for finding their own internships, regardless of it being within a research group or a company. However, the University-Industry Collaboration (UniCo) network maintains quality connections with partner organizations and can assist students in finding suitable placements.

Study feasibility is safeguarded through distribution of workload across the curriculum. Recent curriculum redesigns were explicitly aimed at improving coherence between the different learning lines and preventing overload in particular semesters. The introduction of blended learning tools, such as the Themis environment for programming, has contributed positively to feasibility: students are able to monitor their progress independently, receive immediate feedback, and practise at their own pace. At the same time, the programme deliberately integrates group assignments and projects, which foster collaboration and strengthen both academic and social engagement. Communication and information provision are also well organized. The learning management system Brightspace is used consistently for announcements, materials, and feedback, ensuring that students have timely access to relevant information. Grades and feedback are typically provided within ten working days, and review sessions are common practice.

The panel observes that the bachelor's programme is attentive to the challenges faced by its student population, which includes both international students and those who must adapt to Dutch academic culture and expectations. To support this transition, the programme provides clear information and

orientation activities at the start of the study, equipping students with practical and academic guidance. The system of academic advisors is well developed, with advisors working closely with central university services such as student psychologists and career advisors when specialized support is needed. Students appreciate the accessibility of staff and the atmosphere of informal contact, which contributes to a supportive and open learning environment. The panel highlights the mentor system as a particular strength. Students reported that this structure provides both academic and personal guidance and fosters a sense of community within the programme.

In terms of feasibility, the curriculum can be demanding, particularly for students without a strong prior background in mathematics or programming. Students, however, indicated that they feel well supported by the programme's structure, mentoring, and advising system and did not experience the workload as excessive. The combination of structured support, approachable staff, and a gradual progression from mandatory to more flexible study elements makes the workload manageable. Students appreciate the constructive feedback and accessibility of teaching staff. The panel notes, however, that transparency could be further enhanced by making grading rubrics more consistently available across courses. The panel encourages the programme to consider how policies on attendance and remote participation might best be aligned with student support and community building. Overall, the bachelor's programme provides a supportive yet challenging environment that allows motivated students to succeed while developing autonomy and responsibility.

The master CS builds on the structures present in the bachelor, but adapts them to the needs of a more heterogeneous and international student population. Entry into the MSc is possible from diverse backgrounds, resulting in variation in prior knowledge and skills. The programme therefore provides intensive academic advising at the start of the first year, where advisors help students plan their individual study trajectories within their chosen tracks.

Guidance is embedded at several levels. The programme employs academic advisors who monitor progress, answer personal or academic questions, and assist students in navigating the requirements of their tracks. Supervisors play an important role during the research internship and the master's thesis, where students receive close, individual supervision from staff members associated with one of the research groups in the Bernoulli Institute. Students from all tracks, except the SBP track, may complete their internship either within a research group or externally in collaboration with a company. In both cases, the first supervisor must be a member of staff, while external internships additionally include a daily supervisor at the host organization to ensure continuity and quality of supervision. The UniCo initiative can support students in identifying suitable placements. This system provides a structured framework that helps students find high-quality internships and ensures academic standards are consistently upheld.

Given the strong international character of the MSc cohorts, integration into the academic community is a priority. The student colloquium, a compulsory element across tracks, is explicitly designed to train students in academic communication, peer feedback, and presentation skills, while at the same time providing a platform for social and academic cohesion. Study association activities also support community-building across bachelor and master levels.

Study feasibility is addressed by structuring the curriculum into track-specific course packages that provide coherence and progression. Advisors and track coordinators ensure that students select a feasible combination of courses, balancing compulsory components, electives, and the internship. The possibility of choosing electives from other tracks or faculties allows for flexibility, but requires careful planning to avoid

delays. The Board of Examiners, supported by the academic advisors, plays a crucial role in approving individual study plans and ensuring that they remain realistic.

The programme acknowledges that the workload for students can be challenging. To support feasibility, supervisors provide staged guidance, with regular feedback meetings and clear milestones. Central university services (student counsellors, psychological support, career services) are also accessible to MSc students, complementing the discipline-specific guidance provided within the programme.

The panel concludes that the master's programme offers a learning environment that balances academic challenge with strong supervision and support. The structure of the tracks provides clarity and direction, while the flexibility of elective courses and internships enables individual profiling. Students benefit from close interaction with staff, and both the approachability of teachers and the informal learning environment are highly valued. Academic advisors play an important role in study planning and are well placed to address feasibility issues. The panel encourages them to take an even more proactive role in monitoring course workloads and guiding students through potential mismatches. In this light, the panel also advises to systematically collect and monitor statistics on student progress to support the management team. Some students noted that the workload of courses within a block is not always balanced, and that certain combinations can be challenging. The panel advises revisiting course scheduling and distribution of workload to further optimise feasibility. Despite these challenges, students indicated that they generally experience the programme as feasible and feel well supported in managing the workload. The programme ensures that motivated students can successfully complete their studies within the intended timeframe. The combination of high-level academic expectations, strong supervision, and a collaborative community creates an environment conducive to both personal and professional development.

Both the bachelor and master's programme operate within the university-wide framework for supporting students with disabilities or chronic conditions. The University of Groningen provides a central service point where students can request formal accommodations, such as extra time during examinations, alternative assessment formats, or the use of assistive technologies. Once granted, these accommodations are implemented within the Computing Science programmes in close coordination with academic advisors and the Board of Examiners.

The panel finds that the support system for students with disabilities is well organized and functions effectively. It ensures that necessary accommodations are provided consistently and that affected students can participate fully in all educational and assessment activities.

Teaching staff

The teaching staff of both the bachelor's and master's programmes in Computing Science are predominantly affiliated with the Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence, which hosts seven research groups in Computing Science: Computer Architecture, Computer Graphics and Scientific Visualization, Distributed Systems, Fundamental Computing, Information Systems, Intelligent Systems, and Software Engineering. Almost all staff are active researchers within these groups, ensuring that teaching is closely aligned with the state of the art in the field and that research and education are strongly integrated. This connection is particularly visible in thesis supervision, where students often contribute to ongoing projects and benefit from the Institute's advanced research facilities. The highly international composition of the faculty, with over 90% of staff having a non-Dutch background, further reflects the global orientation of both the programmes and their student body, and contributes to a diverse and stimulating academic environment.

Both programmes make extensive use of Teaching Assistants (TAs), typically advanced BSc, MSc or PhD students, who support staff in tutorials, lab sessions, and grading. TA responsibilities are clearly defined and supervised by course coordinators to ensure consistency and fairness in assessment. Before taking up their roles, TAs receive targeted training from the TA coordinator, including sessions on digital lab support and the use of automated assessment tools such as Themis. While they may assist in grading under the supervision of academic staff, final responsibility for assessment always rests with the examiner. PhD candidates may also act as second supervisors for bachelor's or master's theses, further strengthening the link between education and research.

Since the previous audit, the staff body has expanded considerably. The number of lecturers increased from 25 in 2020 to 33 in 2024, alongside an increase in total teaching FTEs from 8.7 to 14.0. This growth was enabled by new positions through research initiatives such as CogniGron and the national SectorPlans. Notably, nine of these new positions are assistant professorships with an educational focus, dedicating a significant proportion (0.6 FTE) of their workload to teaching and supervision. In addition, one lecturer is exclusively dedicated to teaching. This mixed profile ensures that students are taught both by internationally recognized researchers and by lecturers with advanced expertise in didactics and curriculum design and it has helped alleviate teaching load in the face of student growth, particularly in the BSc programme, where the total number of students enrolled has risen to around 450.

Professionalisation of teaching is a core requirement at the University of Groningen. At present, 24 staff members hold the University Teaching Qualification (UTQ) and eight recently appointed staff are in the process of acquiring it. Furthermore, education-focused assistant professors are expected to pursue the Senior Teaching Qualification (STQ), which certifies competence at the programme and curriculum level. Among them, one staff member has already obtained the STQ and two others are in progress. The panel considers this structured approach to teaching qualifications as an important guarantee for the quality of education.

The panel finds that both the bachelor's and master's programmes are supported by a highly qualified, motivated, and research-active teaching staff. The expansion of staff capacity in recent years has strengthened the educational basis, while systematic investment in teaching qualifications ensures that staff remain equipped to deliver high-quality instruction. All newly appointed staff are required to obtain a UTQ and the balance between research-focused and education-focused staff provides a sustainable structure for the future. The panel notes positively that attention is given to diversity and inclusion in staff recruitment. Approximately 30% of the staff are female (9 out of 33), which is significantly above the average in the computer science field. Moreover, several staff members are active in professional organizations that promote equity, diversity, and inclusion, thereby offering visible role models to students in a discipline traditionally marked by gender imbalance.

The distribution of staff across the bachelor's and master's programmes, however, merits continued attention. The panel observes that few full professors are directly involved in teaching at the bachelor's level compared to the master's. While the department's policy aims at parity, current statistics do not reflect this. This is partly explained by the relatively high number of junior staff with teaching profiles who have recently joined the department, taking on substantial teaching duties. Over time, this distribution is expected to balance out, but the panel stresses that professorial involvement in the bachelor's programme is important, both for academic quality and to provide role models that can inspire students to pursue advanced studies within the department. The panel also underlines the importance of monitoring career progression, ensuring that staff on a teaching-focused career path are given equal opportunities as those with a research profile.

Teaching assistants receive structured training, which the panel considers a positive measure; however, greater flexibility in their deployment would further strengthen the capacity of the teaching team.

Finally, the panel notes that maintaining close relationships with companies for internships and projects is essential, particularly in light of increased student numbers. This task, however, now adds considerably to staff workload. The panel suggests that the department consider appointing a business development manager to coordinate and expand these external contacts, thereby safeguarding the balance between staff workload and external engagement.

Programme-specific facilities

Both the bachelor CS and the master CS benefit from a set of dedicated facilities tailored to the needs of computer science education and research. These go beyond the generic university infrastructure and are specifically developed to support the delivery of computing-intensive teaching and the supervision of student projects. A central provision for students in both programmes is the use of preconfigured virtual machines (VMs). These VMs provide a controlled, uniform environment in which students can immediately work with the required programming languages, compilers, and software frameworks. This approach eliminates the technical barrier of lengthy installation processes and ensures that all students, regardless of their personal hardware or operating system, have access to the same up-to-date tools. Particularly in programming-intensive courses, the VM infrastructure allows for efficient teaching, reliable assessment, and reproducibility of assignments. In addition, the programmes make extensive use of dedicated teaching servers and development platforms for hosting course-specific environments, repositories, and collaborative projects. For example, students gain access to Git-based version control systems and online submission platforms that support the automated testing and grading of programming assignments. These facilities enable staff to design scalable exercises that reflect professional software development practice while ensuring consistency and efficiency in assessment.

For advanced courses, students benefit from access to specialized research labs and computational facilities embedded in the Bernoulli Institute. This includes GPU-equipped servers for machine learning and visual computing courses, distributed systems testbeds, and specialized clusters used in courses on high-performance computing and cybersecurity. Students working on bachelor's projects, master's theses, or research internships are integrated into the existing infrastructure of the research groups, giving them direct experience with state-of-the-art facilities and software frameworks. The MSc programme, in particular, relies on programme-specific facilities to support its advanced tracks. Students in AI Engineering and MLVC make use of GPU clusters and visualization labs, while those in SEDS access distributed computing environments. Students working on topics related to robotics are integrated into dedicated labs with sensor and control hardware. The Science, Business and Policy (SBP) track has access to facilities and support structures tailored to its applied focus, including spaces for policy simulations and stakeholder interaction.

The panel finds that the Computing Science programmes are supported by well-developed programme-specific facilities that are closely aligned with the curricular themes and the research strengths of the Bernoulli Institute. These facilities enable students at both bachelor's and master's level to work in realistic, computing-intensive environments and to engage directly with professional tools and methods. Students particularly benefit from the availability of virtual learning environments and preconfigured virtual machines, which provide a uniform and accessible platform for programming and systems work. This significantly reduces the barriers that students might otherwise face when installing and configuring software on personal machines, allowing them to focus directly on their academic tasks. The panel notes that these facilities are well supported and appreciated by students and staff alike. At the same time, the panel advises the programmes to anticipate the future demands of computer science research and

education. Disciplines such as artificial intelligence and high-performance computing increasingly require access to advanced cloud-based environments and GPU-equipped systems. The panel therefore advises that the programmes and faculty secure sufficient budgetary provisions to guarantee sustainable access to such resources, whether through in-house infrastructure or through purchased computing time.

Considerations

The panel considers the curriculum of both the bachelor and the master in Computing Science to be well designed, coherent, and aligned with the intended learning outcomes. The bachelor programme balances a broad academic foundation with thematic depth in Systems and Data, complemented by a structured progression from compulsory courses to more free space, internships, and the final project. The master offers research-oriented specialization through four tracks and course packages, ensuring both depth and flexibility. The panel appreciates the integration of ethics throughout the curricula, but advises making the role of ethics more explicit in the master's programme.

Admission to both programmes is well organized. The premaster of 30 EC provides a smooth transition for students from universities of applied sciences, by enabling them to incorporate these courses into their present programme, which the panel values highly. The feasibility of the programmes is well safeguarded. Students benefit from a strong mentor system, approachable staff, and clear guidance structures, though the panel suggests revisiting workload distribution in the master.

Both programmes are taught in English, a choice the panel fully endorses given the international nature of the field and the employability benefits. The English language of instruction is well supported by the staff's proven language competence. The teaching staff is highly qualified, research-active, and diverse, with particular attention to gender balance and inclusion. The panel recommends monitoring career progression for staff on teaching tracks and ensuring that full professors remain sufficiently visible in the bachelor. Maintaining close relationships with companies for internships and projects is essential, particularly in light of increasing student numbers. This task, however, now adds considerably to staff workload. The panel advises to reflect on measures to increase support for this task. Finally, programme-specific facilities are strong and well aligned with research themes, enabling students to work in realistic, computing-intensive environments. The panel notes that future investments may be required in cloud-based environments and GPUs to keep pace with technological developments.

Conclusion

The panel concludes that the programmes meet standard 2.

Standard 3. Student assessment

The programme has an adequate system of student assessment in place.

Findings

Assessment

The bachelor CS employs a comprehensive assessment system that ensures alignment between learning outcomes, course objectives, and individual examinations. The programme adheres to the University of Groningen's assessment policy and the Faculty's Teaching and Examination Regulations (TER), complemented by an annually updated assessment plan. This plan provides a clear mapping of intended learning outcomes to courses, specifies examiners for each unit, and details the assessment methods used, thereby guaranteeing transparency and accountability. The assessment framework is built around

constructive alignment. Each course has a Course Unit Assessment Overview (CUAO), which clarifies the learning goals, teaching methods, and assessment strategies. These overviews are systematically checked by the Curriculum Committee and approved by the Board of Examiners. The range of assessment forms is deliberately broad: written exams, programming assignments, projects, oral exams, presentations, and group work are all employed. This variety reflects the diversity of competences targeted in the curriculum, from technical knowledge and analytical reasoning to teamwork and communication.

Particular attention is given to programming assignments, which are supported by Themis, an in-house automated testing and feedback system. Themis is widely used across programming-intensive courses, providing both formative and summative feedback and ensuring consistency in grading. The tool is designed to enhance efficiency and offers students continuous feedback, strengthening their learning process. Transparency towards students is further pursued through the communication of assessment criteria. Rubrics are increasingly used, particularly in group projects and practical assignments, to provide structured feedback and promote fairness. Students receive timely results and have access to feedback mechanisms, including the possibility of oral clarification. Students who choose to do the optional bachelor internship must prepare a project description outlining the learning goals, scope, and tasks of the internship. The final grade is based on an internship report and a presentation in which the student reflects on their achievements and development toward the intended learning outcomes. The evaluation includes both the academic supervisor and, in the case of in-company placements, the daily supervisor from the host organisation. Assessment of soft skills and professional conduct is guided by a dedicated rubric, filled in by the academic supervisor, to ensure fairness and consistency.

The final stage of the bachelor's programme, the individual research project, is assessed according to standardized procedures. Each project begins with a signed starting form outlining objectives and assessment criteria. A midterm evaluation offers an opportunity for formative feedback, while the final evaluation considers four dimensions: scientific quality, project management and skills, oral presentation, and written report. Each dimension is graded by at least two independent examiners, who then reach consensus on the final grade. The use of a faculty-wide standardized form promotes uniformity across projects.

The panel finds the assessment system of the bachelor in Computing Science to be robust, varied, and well-structured. The constructive alignment between intended learning outcomes, course objectives, and assessment methods is clearly visible, and the range of assessment forms – ranging from written exams and programming assignments to group projects and oral presentations – ensures that the different competences of students are addressed appropriately. The system is transparent, with rubrics and clear communication of criteria providing students with fair and comprehensible evaluation standards. In reviewing a representative sample of bachelor's theses, the panel found that the applied assessment procedures are consistently implemented and that the grading is appropriate, transparent, and well justified. The panel concludes that the theses are assessed in a manner that reflects the intended academic level of the programme. The panel concludes that the overall system safeguards both academic integrity and validity, and that assessment in the bachelor's programme is well in order, with no major issues detected.

The master CS applies an equally diversified assessment system, tailored to the advanced level of study and the varied tracks within the programme. Like the bachelor, it operates under the UG assessment policy, the Faculty's TER, and its own annually updated assessment plan, which details the connection between learning outcomes, courses, and methods of evaluation. Each course has a CUAO, which are annually checked for clarity, coherence, and appropriateness of methods. Assessment in the master's curriculum reflects the programme's dual emphasis on academic research and professional practice. Traditional

methods such as written exams and oral examinations are complemented by research-oriented assignments, programming projects, replication studies, and group work. Many advanced courses integrate current research literature, requiring students to critically engage with state-of-the-art developments. This approach aims to strengthen students' ability to analyse complex problems and defend methodological choices.

Automated and digital support tools also play a key role. The Themis system, already widely used in the bachelor's, is applied in master's courses for programming and systems-related assignments, promoting scalability and fairness in grading. The use of rubrics is standard practice in larger assignments and thesis projects, increasing transparency and comparability across examiners. The assessment of individually supervised projects forms the backbone of the master's programme. Students may undertake research internships within university research groups, or external internships in industry, participating in in-company projects, depending on their track. For their internships, like in the bachelor internship, students have to prepare a project description outlining the scope, learning goals, and specific tasks of the student. Assessment is based on an internship report and a presentation that describe the activities undertaken, the achieved outcomes, and a reflection on the student's progress toward the predefined learning objectives. Both the academic and, in the case of in-company internships, the external supervisor contribute to the evaluation. The assessment of professional and soft skills, as demonstrated in the internship report, is carried out by the academic supervisor using a dedicated rubric, ensuring structured and transparent feedback on the student's development.

The final thesis project is assessed by at least two examiners, using a faculty-wide standardized form that covers four domains: scientific quality, project management and skills, oral presentation, and written thesis. Each examiner independently grades these criteria before reaching consensus on the final grade in order to promote objectivity and prevent undue bias.

Specialized elements of the MSc programme, such as the Student Colloquium and the SBP track, have their own assessment designs aligned with track-specific objectives. The colloquium introduces students to peer review and academic conference formats, with assessment covering research paper submission, review, revision, and presentation. The SBP track integrates extended internships and policy-oriented projects, assessed through written reports, stakeholder presentations, and evaluation of professional skills, ensuring alignment with its distinct learning outcomes.

The panel concludes that the assessment system of the master in Computing Science is diverse, transparent, and research-informed, with appropriate safeguards for reliability and validity. The programme's use of research-oriented assignments, replication studies, and thesis projects ensures that students develop the skills necessary for independent research as well as professional application. The assessment system is demonstrably aligned with the intended learning outcomes at master's level. In its review of master's theses, the panel found that the applied assessment procedures are rigorous and consistently implemented. The grading was deemed appropriate and well substantiated, with clear evidence that the evaluation criteria reflect the intended master's-level standards of academic independence and research quality. At the same time, the panel identifies areas for further refinement. The role of ethics in assessment is not always made explicit, although it is embedded in the curriculum. The panel advises clarifying how ethical competences are evaluated, for instance by making them visible criteria in rubrics. In addition, the panel notes that the assessment of soft skills during internships in both the bachelor and the master relies on the same rubric, with only a higher level of performance expected at master's level. The panel questions whether a single rubric can adequately capture the distinct developmental stages of bachelor's and master's students. It suggests establishing differentiated criteria or level descriptors to ensure that each group is assessed

according to appropriate expectations for its academic level, rather than against a shared scale that may inadvertently limit recognition of achievement.

In response to the growing presence of Generative AI, both programmes have taken proactive measures to safeguard the integrity and validity of assessment. University-wide guidelines are applied to ensure responsible use of AI tools and to prevent misuse. Assessment design deliberately combines supervised examinations, oral defences, and group presentations with reflective and process-oriented assignments that are less susceptible to AI interference. This integrated approach allows students to engage critically with AI technologies while maintaining the reliability and authenticity of assessment outcomes.

Board of Examiners

The bachelor CS and the master CS share a Board of Examiners (BoE) with the BSc and MSc Artificial Intelligence and the MSc Computational Cognitive Science, all housed in the Bernoulli Institute. The Faculty Board formally appoints the members. The BoE consists of eight faculty staff members – four from Computing Science and four from the AI programmes – supplemented by one external member. It is supported by a secretary for administrative tasks, and by a formal secretary who acts in an advisory capacity during meetings. The BoE's primary responsibility is to safeguard the quality and integrity of assessment and certification. It ensures that examinations, final projects, and overall programmes meet the requirements of the Teaching and Examination Regulations (TER) and of the intended learning outcomes. In doing so, the BoE determines independently whether each individual student has fulfilled all requirements for graduation.

To fulfil these tasks, the BoE undertakes a structured set of activities each year. It reviews and approves the annual assessment plans of both programmes, including the mapping of intended learning outcomes to assessment methods and the list of appointed examiners. It also systematically checks a sample of examinations for clarity, difficulty, and alignment with course objectives. CUAOs are studied to ensure coherence and transparency. The BoE pays particular attention to individually supervised projects – bachelor projects, master's theses, internships, and colloquia – by appointing qualified examiners and by regularly reviewing samples of final assessments for consistency and fairness. The use of faculty-wide standardized assessment forms provides an additional safeguard for reliability. The BoE monitors quality not only retrospectively but also proactively. Its annual reports summarise key findings, recurring issues, and suggestions for improvement.

A recent and important area of attention is the impact of Generative AI on assessment. The BoE recognises that tools such as large language models pose new challenges, particularly for text-based assignments like essays and reports. Following university and faculty guidelines, the BoE requires that course assessments combine methods less susceptible to AI misuse (e.g. supervised written exams, oral examinations, and presentations) with assignments that stimulate process-oriented and critical reflection. Each new or revised CUAO is reviewed with this perspective in mind. Furthermore, the BoE investigates suspected cases of plagiarism or AI-assisted work carefully, and provides feedback to teaching staff and programme management to further refine assessment design. These measures aim to ensure that the integrity of examinations and final qualifications is not compromised while maintaining a constructive balance between innovation and safeguarding.

The panel finds that the BoE of the Computing Science programmes plays an active, independent, and well-structured role in safeguarding the quality of assessment. The BoE communicates effectively with staff, follows clear procedures, and takes a proactive stance towards emerging issues. The panel values the BoE's awareness of the challenges posed by generative AI and appreciates the constructive measures taken to safeguard assessment integrity while allowing for innovation. The panel is convinced that the BoE

contributes decisively to the robustness of the programmes' assessment systems and thereby to the value of the awarded degrees. At the same time, the panel identifies several areas where further strengthening is desirable. First, the panel notes the absence of a formal procedure in cases of disagreement between examiners. While such disagreements have not been reported, the panel believes that the lack of a process may prevent cases from coming to light or may result in informal hierarchies influencing outcomes – for instance, when a professor's opinion outweighs that of a junior colleague. The panel advises the BoE to introduce a clear policy, such as appointing a third examiner to arbitrate disagreements, to ensure fairness and transparency. Second, the panel stresses the importance of guaranteeing the independence of the second examiner. At present, examiners are often drawn from the same research group, where hierarchical relationships may compromise independence. The panel advises the BoE to implement measures to ensure that second examiners can act fully independently of the first, thereby strengthening the objectivity of thesis evaluations. Finally, the panel noted the relatively high proportion of students graduating cum laude, which in the past five years has ranged between 20% and 45%. While the panel recognizes the strong quality of students (see standard 4), it considers that grade inflation appears to be a contributing factor to this trend and believes that such a high percentage may eventually dilute the value of the distinction. The panel therefore suggests that the BoE consider developing clearer and more stringent grading guidelines to ensure greater consistency and to safeguard the prestige and credibility of the cum laude distinction.

Considerations

The panel concludes that the assessment systems of both the bachelor and the master in Computing Science are robust, varied, and transparent. The combination of written exams, programming assignments, projects, and oral presentations ensures that a broad range of competences is assessed in a fair and structured way. Instruments such as rubrics and the Themis automated system contribute to transparency, comparability, and timely feedback. The panel finds the thesis assessment procedures particularly strong, with clear rubrics, and structured feedback contributing to reliability. The panel also commends the balanced approach to Generative AI, noting that assessment methods have been thoughtfully adapted to preserve integrity while encouraging students to engage critically and responsibly with emerging technologies. At the same time, the panel sees scope for refinement. In the master's programme, the role of ethics in assessment should be made more explicit, and the assessment of soft skills in the internship could be better differentiated between the bachelor and master programme. The panel also finds that the Board of Examiners plays a vital role in safeguarding assessment quality. To further strengthen its work, the panel advises the BoE to formalize a procedure for examiner disagreements and guarantee independence between first and second examiners. Finally, in the light of the currently high cum laude percentages, the panel advises to consider more stringent grading guidelines to ensure consistency and to maintain the exceptional character of the cum laude distinction.

Conclusion

The panel concludes that the programmes meet standard 3.

Standard 4. Achieved learning outcomes

The programme demonstrates that the intended learning outcomes are achieved.

Findings

Thesis quality

The panel reviewed a representative sample of theses from both the bachelor and the master in Computing Science and concludes that their overall quality is very high and appropriate for the respective levels. The

panel notes that great care and effort is evident in the theses, reflecting the strong supervision and academic orientation of both programmes.

For the bachelor's programme, the theses confirm that students acquire solid academic and research skills during their studies. The panel was impressed by the quality of the work, which in several cases exceeded the expected level for undergraduate study. A notable fraction of the theses has resulted in publications, which is remarkable for a bachelor's programme. One thesis, in particular, was singled out by a panel member as truly excellent and of publishable quality, exemplifying the strong research orientation embedded in the programme.

The master's theses were also evaluated very positively. The panel found the theses to be well executed, demonstrating a high degree of independence and the ability to apply advanced methodologies. Many theses successfully combined academic rigour with practical relevance, presenting experimental results or addressing external use cases in industry or applied research. The panel particularly appreciated this connection to real-world problems, which shows that students not only master theoretical and research competences but also acquire experience in applying their knowledge to societal and professional contexts.

Taken together, the theses confirm that both the bachelor and the master in Computing Science deliver graduates with strong academic skills, capable of contributing meaningfully to research, innovation, and professional practice.

Alumni success

Graduates of the bachelor CS follow diverse paths upon completion of their degree. Survey data from recent cohorts indicate that nearly one third (28-38%) continue directly into the MSc Computing Science at Groningen, while another 20-23% pursue a Master's elsewhere, with TU Delft mentioned as a particularly popular destination. Around a quarter (23-30%) enter the labour market immediately after graduation, demonstrating that the bachelor's degree provides sufficient employability for students wishing to start their careers without further study. A smaller share (8-20%) remain undecided or follow other routes at the time of graduation.

Alumni survey results from 2025 (72 respondents) reveal that 63.8% of graduates either already had a job or found one within three months of graduation, while a further 8.3% secured employment within four to six months. Only 6.9% reported needing more than six months to obtain their first position. Employment opportunities are both national and international: while 75% of alumni live in the Netherlands, less than half (48.6%) are originally Dutch, indicating the programme's international scope and relevance. Graduate destinations are broad. A significant proportion pursue research careers, with one in six graduation projects across both CS programmes leading to publications in journals or conference proceedings. Others take up roles in the technology sector, including software development, AI, data science, and systems engineering. This is often within the region: the External Advisory Panel notes the growing demand for highly qualified computing scientists and highlights the need for even larger graduate cohorts to meet industry needs.

The panel finds that graduates of both the bachelor and master in Computing Science demonstrate strong outcomes, confirming the academic and professional relevance of the programmes. Alumni with whom the panel spoke during the site visit expressed that they had felt well prepared for their careers, and representatives from the professional field confirmed that graduates meet expectations and integrate successfully into the labour market.

For the bachelor's programme, the distribution of graduate destinations reflects both the academic and professional orientation of the curriculum. A substantial share of students progress to master's programmes, demonstrating the programme's academic character, while a notable fraction move directly into employment, showing the degree's labour market value. The panel does, however, note that relatively few bachelor graduates continue into Groningen's own MSc Computing Science, which is a point of attention given the master's ambition to grow. Strengthening retention could help secure a steady inflow of motivated students. The master's programme shows very strong employability results. A large majority of graduates secure employment within three months, mainly in industry, with a smaller but steady share continuing into PhD positions. Overall, the panel considers the occupational level of graduates to be very high.

The panel advises both the bachelor's and master's programmes to systematically collect and analyse alumni statistics. A clearer understanding of graduates' destinations and career paths would not only support continuous quality assurance but could also strengthen the programmes' marketing and outreach, particularly important in light of increasing student numbers and the growing demand for computing science graduates.

Considerations

The panel concludes that the bachelor and master programmes in Computing Science deliver graduates of a high calibre. The theses reviewed clearly demonstrate that students acquire strong academic and research skills, with several bachelor projects even exceeding the expected level for undergraduate study. The occurrence of bachelor theses leading to publications is exceptional and illustrates the research-oriented profile of the programme. At master's level, the panel observed well-executed projects that combine academic rigour with practical relevance, often presenting experimental results or addressing external use cases. This balance between scholarly quality and applicability confirms that graduates are well prepared for both doctoral research and demanding professional roles.

Graduate outcomes reinforce this conclusion. The bachelor's programme enables multiple pathways, with many students continuing to master's studies while others successfully enter the labour market. The master's programme shows particularly strong employability, with most graduates securing positions shortly after graduation.

Conclusion

The panel concludes that the programmes meet standard 4.

General conclusion

The panel judges that the bachelor's and the master's programme meet all four standards. The panel's assessment of the programmes is therefore positive.

Recommendations

No recommendations were formulated.

Appendix 1. Intended learning outcomes

Bachelor's programme ILO's

Holders of a Bachelor's degree in Computing Science:

1. Have the following knowledge, understanding and insights on an academic level:
 - a. knowledge of the main topics of Computing Science;
 - b. understanding of common themes and principles of Computing Science on different levels of abstraction;
 - c. insight in the applicability of Computing Science and the interplay between theory and practice;
 - d. either d1: in-depth knowledge of certain topics in the field of Computing Science, or d2: broad-based knowledge of topics in a different discipline.
2. Have the following skills and competences, on an academic level:
 - a. technical skills associated with Computing Science, including relevant mathematical and logical skills;
 - b. relevant soft skills, including communication, intercultural teamwork and self-managed learning;
 - c. academic skills, including conceptual thinking, critical questioning, judgement forming, scientific research, writing and presenting in English;
 - d. the competence to analyze, structure, redefine and solve problems, using computational methods and tools;
 - e. the competence to design, develop and evaluate computer systems;
 - f. the competence to apply their knowledge and understanding of Computing Science in a globalized professional and entrepreneurial context.
3. Have the following attitudes:
 - a. appreciation of the role and importance of mathematics, related disciplines and domain-specific knowledge;
 - b. commitment to professional responsibility, including ethical, societal and intercultural issues, with a self-critical attitude;
 - c. critical and academic attitude towards information and knowledge;
 - d. preparedness to life-long learning, based on the awareness of the highly dynamical character of Computing Science.

The Master graduate in Computing Science:

- Is fully acquainted with the advanced terms and techniques used in Computing Science, and is familiar with a number of classical problems and their solutions;
- Is experienced in the effective use of the tools available in solving Computing Science problems, such as compilers, theorem proofs, visualisation software, case-tools and domain specific software and hardware;
- Is familiar with Computing Science applications in several other scientific fields of study;
- Is capable of clear communication (both oral and in writing) on the subject of Computing Science and its applications;
- Is capable of working in a team and in various projects;
- Is sensitive to the social aspects of Computing Science applications and their own responsibilities therein;
- Has specialized knowledge of theories, methods and techniques in one of the following subfields of Computing Science:
 - o Machine Learning and Visual Computing
 - o Software Engineering and Distributed Systems
 - o AI Engineering
 - o Science, Business & Policy

- Is able, by using scientific data and assessments, to analyse problems in Computing Science or a related scientific field of study, to provide specified solutions to the problem, and – if possible – to materialise these solutions (in the shape of an algorithm or program or an implementation in software or hardware);
- Is able to critically read professional literature and to assess its correctness, usability and relevance;
- Is able to contribute to the enhancement of scientific understanding in a subfield of Computing Science;
- Has a proper understanding of the scientific relevance of problem definitions and results, and of the validity of the scientific method used.
- Has the ability to design and implement software, integrating and reusing existing components where necessary, into a solution or system that meets quality criteria agreed upon with interested parties.

The Master in Computing Science graduated in the subfield of Science, Business & Policy (SBP):

- Has a full understanding of the way in which businesses and policy organisations are functioning (governments and nongovernmental organisations, NGO's);
- Understands the connections between natural science research, trade and industry and governmental policies;
- Is able to integrate aspects of natural science, business and management;
- Is able to translate a concrete problem definition in business or management into a natural science problem definition;
- Is able to connect problem aspects of natural sciences to other relevant subject fields;
- Is able to put research data and conclusions into a business or policy context;
- Has developed their social and communicative skills:
- Is able to write texts that are effective and to the point;
- Is able to draw up an innovation plan or management plan for either a business or a government organisation;
- Is able to give convincing oral presentation;
- Is able to deliver an active contribution to plenary discussions;
- Familiar with techniques used in business meetings and is capable of chairing a meeting;
- Is able to work on a project as part of a team;
- Is able to give and receive feedback concerning their way of functioning in a team;
- Can work in a project;
- Is able to fully consider the interests or objectives of the ordering customer;
- Is able to plan a project independently;
- Is able to cooperate with the relevant parties involved in the project;
- Is able to adequately deal with limitations in time, information and means;
- Is able to prepare the implementation of a project result;
- Is capable of taking professional responsibility;
- Is able to take responsibility on behalf of the organization;
- Is able to recognize the strategic aspects of their own project;
- Is able to provide practical solutions in matters concerning the ethical and professional codes of their own field of expertise and of the professional organization

Appendix 2. Programme curriculum

Bachelor Computing Science

Bachelor	1a	1b	
Year 1	Programming Fundamentals		Algorit
	Introduction to Logic (CS)	Computer Architecture	Calcul
	Introduction to Computing Science	Discrete Structures	Introdu
Year 2	Calculus 2	Statistics and Probability	Introdu
	Advanced Programming	Web Engineering	Opera
	Advanced Algorithms	Functional Programming	
Year 3	Information Retrieval*	Introduction to Image Processing*	Funda
	Computational Complexity*	Process-aware Information Systems*	Inform
	Signals and Systems for CS*	Compiler Construction*	Resea
	Computer Graphics*	Introduction to Augmented Reality *	
	Bachelor Internship*	Bachelor Internship*	
	Introduction to Deep Neural Network	Basic Approaches to the Semantics of Computation*	
	C++ Fundamentals	Programming in C++*	Advan
	* CS elective courses in the Minor space in 1a and 1b		
2a	2b		
Algorithms and Data Structures in C++	Object-Oriented Programming for CS		Core
Introduction to Information Systems	Linear Algebra		Systems
	Computer Networks		Data
Introduction to Machine Learning	Languages and Machines		
Operating Systems	Introduction to Computer Graphics and Visualization		
Software Engineering			
Fundamentals of Distributed Systems	Bachelor's project		
Information Security			
Research Skills in Computing Science			
Advanced programming in C++*			

Master Computing Science

Master	1a	1b	2a	2b
All- Year 1 All-Year 2			Student Colloquium Master Thesis	In-Company or Research Internship
SEDS Theoretical CS	Models and Semantics of Computation	Modal Logic and Proof Theory Logical Aspects of Multi-Agent Systems Software Language Engineering	Programs and Interactive Proofs Algorithms for Computationally Challenging	
SEDS Software Engineering	Cloud Computing and Cloud-based Applicati Software Architecture	Software Maintenance and Evolution Evidence-Based Software Engineering	Software Analytics Advanced Software Architecture	
SEDS Large-Scale Software Systems	Cloud Computing and Cloud-based Applicati Performance Engineering	Enterprise Application Integration Information Systems Advanced Distributed Systems	Scalable Computing	
SEDS Cybersecurity	Advanced Topics in Security and Privacy Network Security Analytics Kernel Engineering and Security	Ethical Hacking Hardware Security	Software and System Security	
SEDS Advanced Computer Architecture	Embedded Systems Performance Engineering Kernel Engineering and Security	Hardware Security	Emerging Computer Architectures	
MLVC Applied Data Science	Introduction to Data Science Social Network Analysis Modelling and Simulation	Pattern Recognition for CS Scientific Visualization		
MLVC Machine Learning Theory	Introduction to Data Science Robotic State Estimation Advanced Machine Learning (AI)	Intelligent Mobile Perception in Practice Neural Networks and Computational Intelli	Multimodal Mobile Sensing Theory of Machine Learning	
MLVC Visual Computing	Perception for Visual Computing Geo-Visualization	Advanced Computer Graphics Multi-Scale and Advanced Image Analysis Scientific Visualization	Computer Vision	
AI Engineering Engineering of AI Systems	Introduction to Data Science Cloud Computing and Cloud-based Applicati Advanced Machine Learning Human- Centered Artificial Intelligence	Machine Learning Systems Deployment and Deep Learning Data Challenges in AI systems Scientific Visualization	Scalable Computing Trustworthy and Explainable AI	
AI Engineering Robotics	Introduction to Data Science Robotic State Estimation Robotics for AI	Intelligent Mobile Perception in Practice Cognitive Robotics	Multimodal Mobile Sensing Control Methods for Robotics	Human-Robot Interaction for Social Robot
SBP (Science, Business and Policy) Year 1			Student Colloquium (5 ECTS)	Research Internship (CS) (15 ECTS)
Year 2	Introduction Science and Policy (10 ECTS) Introduction Science and Business (10 ECTS)		Work Placement Business and Policy (40 ECTS) Work Placement Business and Policy (40 ECTS)	

Theme:	
Core	
Systems	
Data	
Systems+Data	

SBP: 80 ECTS Mandatory	
20 ECTS out of a single course package from one of the other CS tracks	
10 ECTS out of any course package from the track chosen above	
10 ECTS from any other CS track	

Appendix 3. Programme of the site visit

Day 1: 29 September 2025

11.30-11.45 **Welcome**

11.45-12.30 **Panel preparation** incl. lunch

12.30-13.30 **Interview programme management**

13.30-13.45 **Break**

13.45-14.45 **Interview BSc and MSc teaching staff**

14.45-15.00 **Break**

15.00-16.00 **Interview / thematic session Industry, alumni**

16.00- 17.00 **Tour of facilities:** Cover room, (Study association), Engineering lab

17.00-18.00 **Internal panel session** (drawing up findings)

Day 2: 30 September 2025

09.00-09.15 **Panel preparation**

09.15- 10.15 **Interview BSc and MSc students**

10.15-11.00 **Interview Board of Examiners**

11.00-11.15 **Break**

11.15-12.00 **Thematic session: Impact of GenAI on education:**

12.00-12.45 **Lunch**

12.45-13.30 **Thematic session: Growth in efficiency**

13.30-15.00 **Internal panel session** (drawing up findings)

15.00-15.30 **Concluding session management + FB**

15.30-16.00 **Internal panel session**

16.00-16.30 **Oral feedback panel**

Appendix 4. Materials

Prior to the site visit, the panel studied 15 theses per programme. Information on the theses is available from Academion upon request.

The panel also studied other materials, which included:

- Reading Guide BSc and MSc Computing Science
- Student Chapter BSc and MSc Computing Science UG
- SWOT BSc and MSc Computing Science
- Overview of the new BSc CS curriculum and learning lines
- Overview of the new MSc CS curriculum and learning lines
- Panel report Audit 2019
- Mid-term report CS 2024
- Learning Outcomes Bachelor and Master
- Learning Lines
- Annual Reports Programme Committee
- Detailed Course Information and CUAO
- TER BSc CS 2025-26
- TER MSc CS 2025-26
- Screenshot Student Portal CS
- Best Practice in Teaching and Learning Award
- External Advisory Panel
- Assessment plan BSc CS 2025-26
- Assessment plan MSc CS 2025-26
- Final Assessment Form
- Annual Reports BoE CS
- Overview of the previous BSc curriculum
- Overview of the previous MSc curriculum
- List of publications
- Alumni questionnaire results
- FSE AI in Education
- Digital Lab Team
- Onderwijskaart Bachelor
- Onderwijskaart Master
- Course units material: Advanced Computer Graphics, Algorithms and Data Structures, Enterprise Application Integration, Fundamentals of Distributed Systems, Machine Learning Systems Deployment and Operations and Web Engineering
- Teaching Staff Overview
- Internship Reports