

M Software Engineering
University of Amsterdam

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Project code P2409

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Summary

Standard 1. Intended learning outcomes

The panel appreciates the programme's vision and intended learning outcomes, which both are well-aligned with national and international requirements, and which adequately prepare graduates for professional roles in the software engineering sector and in academia. The panel recommends updating the ILOs to reflect recent developments in GenAI. The close relationship with the professional field helps the programme to remain relevant and responsive to current industry needs.

Standard 2. Teaching-learning environment

The panel appreciates the effective translation of the programme's intended learning outcomes into a coherent and well-structured curriculum. The one-year design successfully concentrates the broad field of software engineering. The curriculum thoughtfully balances theoretical foundations with practical application, and integrates hard technical skills alongside soft management-oriented competencies and research skills. Guest lectures from industry professionals and networking events enrich the learning experience and connect students to the professional field. Moving forward, the panel recommends continuously investing in updating the curriculum and incorporating emerging technologies and industry trends. In addition, strengthening the integration of societal and ethical considerations throughout the curriculum is seen by the panel as an opportunity.

The panel is positive about the programme's admission requirements, which are clearly defined and realistically aligned with the intended learning outcomes. The active teaching methods, appropriate guidance and support, feasible study conditions, justified use of English, comprehensive information provision, and adequate facilities for students with support needs, all contribute to a supportive and student-centered learning environment, and help students navigate academic challenges and personal issues. The panel recommends developing and implementing a structured and proactive study planning and monitoring system for courses and the master thesis, and improving communication channels with students to support timely progress and reduce delays. The diverse and competent teaching staff uphold the programme's commitment to delivering high-quality, research-informed education. They benefit from their embedding in four diverse research groups, which allows staff to bring current practical insights into the curriculum.

Standard 3. Student assessment

The panel is content with the programme's sound assessment framework, with clear principles of validity, reliability, and transparency that are well reflected in the programme's assessment practice. The master thesis assessment is detailed and constructive. The presence of regular feedback meetings with students is viewed positively, and the panel encourages continuation of this practice. The programme's proactive stance toward the challenges posed by generative AI underscores its commitment to maintaining academic standards and assessment integrity in a changing educational landscape. The panel recommends continuous attention for clear and uniform procedures to address the use of GenAI, and to maintain a systematic record of all suspicious cases. It pleases the panel to see that the Examinations Board is proactively reviewing all course assessment plans, and that support for the Board has improved.

Standard 4. Achieved learning outcomes

The panel is content to see that the students achieve the intended learning outcomes of the programme. This is confirmed by the quality and relevance of thesis projects, and the positive performance of graduates

in both professional practice and postgraduate education. It pleases the panel to see that several thesis projects result in scientific papers.

Score table

The panel assesses the programme as follows:

M Software Engineering

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. ir. Bart Preneel, Panel chair	Dr. Rik Ligthart, Secretary

Date: 16 March 2026

Introduction

Procedure

Assessment

On 26 & 27 November 2025, the master's programme Software Engineering of the University of Amsterdam (UvA) was assessed by an independent peer review panel as part of the cluster assessment WO Informatica groep 3. The assessment cluster consisted of 25 programmes, offered by the Open Universiteit, Leiden University, the University of Groningen, Utrecht University, Radboud University, Eindhoven University of Technology, Delft University of Technology, Vrije Universiteit Amsterdam, the University of Amsterdam, and the University of Twente. 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 cluster WO Informatica groep 3. Peter Hildering and Yannick Slagter acted as coordinator in the cluster assessment. Rik Ligthart acted as secretary for the assessment of the programmes of University of Amsterdam. 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 three panel members 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 programme composed a site visit schedule in consultation with the coordinator (see appendix 3). The programmes selected representative partners for the various interviews. It was 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 programme provided the coordinator with a list of graduates over the period 2023-2024. In consultation with the coordinator, the panel chair selected 15 theses. This included 12 students from the fulltime variant, and 3 students from the parttime variant. Prior to the site visit, the programme provided the panel with the theses and the accompanying assessment forms. It also provided the panel with the information file 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 documentation file and the theses, as well as the division of tasks during the site visit. The panel was also informed on the assessment framework, 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). Care was taken that students from both the fulltime and parttime variant were present during the student interview. The panel also offered students and staff members an opportunity for confidential discussion during a consultation hour. No consultation was requested. 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 the coordinator 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 University of Amsterdam.

Panel

The panel assessing the M Software Engineering at the UvA consisted of the following members:

- Prof. dr. ir. B. (Bart) Preneel, Full Professor Computer Security and Industrial Cryptography at the Faculty of Engineering, KU Leuven [Chair];
- Prof. dr. M. (Marieke) Huisman, Professor Software Reliability at the Faculty of Electrical Engineering, Mathematics and Computational Sciences at the University of Twente (UT);
- Prof. dr. F. (Fabiano) Dalpiaz, Professor Software Production at the Faculty of Beta Sciences, Utrecht University;
- Em. prof. dr. B. (Bastien) Chopard, Emeritus professor at the Computer Science Department of the University of Geneva;
- I. (Imane) el Caïdi BSc, Master student Computer Science (track Algorithm Design and Analysis & Operations Research at Utrecht University [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 programme

Name of the institution:	University of Amsterdam
Address:	Nieuwe Achtergracht 166, 1018 WS, Amsterdam
Website:	www.uva.nl
BRIN-number:	21PK
Status of the institution:	Publicly funded institution
Result institutional quality assurance assessment:	Positive
Programme name:	Software Engineering
ISAT number:	60228
Orientation of the programme:	Academic

Level of the programme:	Master (NLQF 7)
Number of credits:	60 EC
Language of instruction:	English
Professional requirements:	No
Location:	Science Park, Amsterdam
Mode(s) of study:	Fulltime, parttime
Assessment group:	Informatica groep 3
Awarded degree:	MSc
Submission date NVAO:	1 May 2026

Description of the assessment

Organization

The master's programme Software Engineering (SE) is offered at the University of Amsterdam (UvA), a publicly funded institution located in Amsterdam. The university provides education in computer science, social sciences, humanities, communication and media studies, psychology, law, and economics. UvA hosts a diverse population of over 40,000 students, including a high proportion of international students. Many bachelor's programmes are taught in Dutch, while most master's programmes are delivered in English.

The SE programme is embedded within the Graduate School of Informatics (GSI) of the Faculty of Science (FNWI) at the UvA. The GSI comprises eight master's programmes and is centered in the Lab42 building, which provides a unique learning environment connected to Amsterdam's dynamic informatics ecosystem. The programme benefits from strong alignment with research expertise from the UvA's Institute for Informatics (IvI) and related research groups, which ensures research-based teaching and supervision for students' master projects.

The programme has a fulltime and a parttime variant. Both variants provide the same curriculum, learning outcomes, educational resources, assessment standards, and student support. Differences are primarily in the pacing and scheduling of courses to accommodate part-time students' work commitments. Panel findings, considerations, and conclusions in this report adhere to both variants, unless explicitly stated otherwise.

Recommendations previous panel

The previous accreditation panel issued a number of recommendations for the programme. The panel recommended the programme, among others, to enhance the professional advisory board, to reinforce staffing, and to improve the quality of feedback on thesis defense. The panel finds that these advices have been considered carefully, leading to further improvement of the programme. See, for further discussion, the respective sections in the report on these topics.

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

Vision and intended learning outcomes

The master Software Engineering is designed as a one-year academic programme aiming to train students in the field of software engineering, which is broadly defined as the systematic, disciplined, and quantifiable approach to the development, operation, and maintenance of software. The programme emphasizes a balance between technical competencies and human aspects critical for success in complex software engineering projects, such as strategic thinking, systems design, and stakeholder engagement skills. The vision of the programme is grounded in a hands-on, research-based educational approach that integrates principles, methodologies, and real-world projects to equip students with the ability to address current and emerging challenges in software engineering. The programme aims to prepare graduates for professional roles that involve technical expertise in software engineering, including methodologies, principles, and real-world projects. Students are also prepared for PhD positions and roles like Research Software Engineer.

The intended learning outcomes (ILOs) of the programme are anchored in the internationally recognized Software Engineering Body of Knowledge (SWEBOK v3). They encompass engineering abilities such as design thinking, the application of diverse tools and frameworks, and the integration of research skills that foster continuous learning and adaptation, which are all vital for software engineering practice and innovation. The core focus is on (software) engineering skills: completing tasks (even with incomplete designs), progressively deepening the understanding of the problem during its resolution (design thinking), and utilizing a diverse range of programming languages, frameworks, and tools. The ILOs also address management and communication skills, which are essential for leadership roles in software engineering. The ILOs are drawn up in reference to the Dublin descriptors and the Dutch qualification framework NLQF to reflect the appropriate master's level.

Based on the documentation and discussions during the site visit, the panel finds that the programme demonstrates a clear and well-articulated vision and an industry-oriented profile that is strongly underpinned by research. The programme offers students both the theoretical foundation and practical skills necessary for success in the software engineering field. The intended learning outcomes are suitably ambitious and cover both technical and organizational aspects of software engineering, including research skills, critical thinking, and communication, which are integrated as part of the programme's vision. The ILOs reflect an academic orientation and reflect NLQF level 7. They effectively balance technical competences with human and management skills. The programme prepares students for professional careers as software engineers, which is evidenced by the programme's alignment with international standards such as SWEBOK, and emphasis on real-world projects and stakeholder engagement.

The panel notes that while the programme recognizes the importance of emerging topics such as the impact of GenAI, this area has not yet been fully integrated into the learning outcomes. Therefore, the panel recommends updating the ILOs in view of GenAI developments. This will ensure that the curriculum remains relevant and prepares students for emerging industry demands. The panel believes that, with the expertise of the teaching staff, the programme could be a university frontrunner in shaping the future of computer science education in the light of GenAI.

Role of the professional field
The professional field plays an important role in shaping the programme's ILOs and vision. The programme maintains connections with industry and research institutions by involving guest lectures, by providing students with real-world case studies, by organizing alumni events, and by offering collaborative graduation projects with industrial partners. Part-time students who are actively employed in the software industry provide continuous feedback on the applicability of course content, and several lecturers have part-time industry roles, which grounds their teaching in professional realities. Also, the programme benefits from a Professional Advisory Board (PAB) at the Graduate School of Informatics level, which includes senior industry representatives who advise on educational needs and curriculum updates in response to an evolving industrial IT landscape.

The panel finds that the programme maintains strong connections with industry, which is evident through the advisory board, through contributions by guest lecturers from the professional field, and the inclusion of real-life challenges in master projects proposed by organizations and industries. During the previous site visit, it was recommended to enhance the PAB by extending membership to cover the entire domain of software engineering, and by meeting more regularly. The panel finds that the programme has addressed this recommendation properly. Alumni events and meetups further strengthen the relationship between

graduates, current students, and the professional field, and create a programme that is aligned with both academic and industry developments.

Considerations

The panel appreciates the programme's vision and intended learning outcomes, which both are well-aligned with national and international requirements, and which adequately prepare graduates for professional roles in the software engineering sector and in academia. The panel recommends updating the ILOs to reflect recent developments in GenAI. The close relationship with the professional field helps the programme to remain relevant and responsive to current industry needs.

Conclusion

The panel concludes that the programme meets 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

The curriculum is structured as a 60 EC programme divided into two semesters, each with multiple teaching blocks. The fulltime programme is structured to be completed in one year, while the parttime programme is designed to be completed in two years of 30 EC each. During the three regular teaching blocks (blocks 1, 2, and 4), fulltime students take two courses of 6 EC in parallel. Parttime students take one course per block, spreading the two courses over two years. Students follow a sequence of six courses covering core software engineering topics such as Requirements Engineering, Software Specification and Testing, Software Evolution, and DevOps and Cloud-based Software. Courses such as Requirements Engineering and DevOps and Cloud Software involve direct interaction with stakeholders for requirements elicitation and validation. The curriculum covers core topics across the software development life cycle, including agile methodologies, model-based development, automated testing, autonomous systems, software quality, and maintenance. The academic year finishes with an 18 EC Master Project which involves independent research that is aligned with academic and industrial standards. Starting early in the programme and running in parallel with other courses, the Preparation Master Project course (also 18 EC) develops students' research skills and prepares them for their Master Projects.

Based on the documentation and the discussions during the site visit, the panel finds that the intended learning outcomes are adequately translated into curriculum components. The curriculum is well-structured and logical, and concentrates the field of software engineering in a one-year programme, making it attractive to both fulltime and parttime students as well as international applicants. It combines theoretical and practical knowledge, and balances hard technical skills with soft management-oriented skills and research competencies. The curriculum offers valuable events and networking opportunities, and strong contributions from guest lectures from the industry. The panel observes that there is a lack of elective space in the curriculum, but considers it not a significant issue, as students are content with the curriculum and do have choices in selecting thesis topics and in certain assignments.

As a general recommendation, the panel encourages the programme to continuously invest in updating the curriculum and incorporating emerging technologies and industry trends. Specifically, while the curriculum covers essential software engineering topics, the panel suggests to integrate software security more explicitly. Also, the panel finds that the emphasis on societal and ethical aspects within the curriculum could be increased. Therefore, the panel recommends to strengthen the integration of societal and ethical considerations throughout the curriculum, with particular attention to embedding these aspects explicitly in the graduation project.

Admission requirements and language
Admission to the programme is primarily granted to candidates with a bachelor's degree in Computer Science or a closely related subject from a Dutch university, or an equivalent foreign qualification. Candidates with a degree from a university of applied sciences must have a GPA of 7 or higher and may be required to complete a premaster trajectory to bridge knowledge gaps. For international candidates, equivalency of previous education is carefully assessed, and the programme does not offer a premaster trajectory to this group. The admission process involves a thorough evaluation of prior knowledge and motivation, including questionnaires, cognitive tests, and interviews where necessary.

The programme name and language of instruction are English, consistent with the Faculty of Science and Graduate School of Informatics. The choice of English as the language of instruction aligns with the international orientation of the programme. This decision reflects the dominance of English in software engineering terminology, research, and professional practice, as well as the diverse international student body and teaching staff. English instruction facilitates cross-cultural collaboration and access to global academic resources. The teaching staff is proficient in English, able to provide effective communication and high-quality instruction.

The panel notes that the programme has clearly defined admission requirements that align realistically with its intended learning outcomes. Incoming students are adequately prepared when entering the programme, among others through the offering of a premaster programme. The programme is taught entirely in English because of the international orientation and scope of the programme, and the panel adheres to this viewpoint.

The panel finds that the proportion of female students remains relatively low despite slight improvements in recent years (the programme increased from 2% to 14% female students). The panel, acknowledging that all Computer Science programmes are facing this challenge, suggests intensifying outreach efforts to attract even more female students. This could be achieved by emphasizing the societal relevance of computing and software engineering, by inviting female student ambassadors, and by increasing the visibility of female role models among teaching staff and alumni. Collaboration with secondary schools and targeted information sessions could also help.

Learning environment
The didactical approach of the programme accentuates active learning where students engage deeply with the material, complemented by intensive guidance from teaching staff. Students work on assignments and projects often in pairs or groups, involving real-world use cases sourced from industry partners or open sources. Guidance and supervision are integral components of the educational environment. From the outset, students receive structured support, beginning with a dedicated welcome session and continuing through regular interactions with the Preparation Master Project and Master Project teams. Weekly supervision meetings, milestone presentations, and continuous feedback support students throughout their studies. The programme also offers social cohesion meetings to foster a collaborative learning community.

Administrative and academic support is further provided by a study adviser, a programme coordinator, and access to university-wide services such as the Writing Centre. Students receive detailed guidance through a dedicated student handbook and continuous communication via mailing lists, Slack channels, and university platforms such as Canvas and DataNose.

Among fulltime students, over 50% successfully complete the programme within one additional year beyond the nominal time. For parttime students, this figure remains below 50%. The programme addresses feasibility in the design and delivery of the programme, among others via clear expectation management, coaching in time management, and early engagement with research projects. Efforts to mitigate study delays include the development of a thesis project tracking system to monitor progress and identify at-risk students early. The programme also accommodates part-time students by scheduling course activities to allow for study alongside professional commitments. All activities of one course are scheduled on Mondays and Tuesdays, while activities of the other course are scheduled on Wednesdays and Thursdays.

For students with additional support needs, the programme benefits from the university's student counsellors who assess individual requirements such as dyslexia, neurodiversity, or physical impairments. Advice or guidance provided by a student counsellor are coordinated with the programme to provide appropriate accommodations. Customized solutions are available for non-standard cases, and the university offers facilities like quiet rooms and contemplation rooms to support students' well-being. A faculty coordinator for study facilities has been appointed to better organize complex support needs.

Based on the documentation and the discussions during the site visit, the panel finds that the programme employs active, research-driven, hands-on, and student-centered teaching methods to provide an inspiring learning environment. The programme offers strong supervision and feedback mechanisms, and the information provision to students is comprehensive and multifaceted. The student handbook, which facilitates clarity about programme expectations and support mechanisms, is an excellent information resource for students. Facilities for students with support needs are adequately addressed, with specific mention of provisions for those with impairments, demonstrating the programme's commitment to accessibility and inclusivity. The teaching is organized in blocks during semesters, which aids student focus.

The panel observes that the programme has developed a strong and inclusive student community. This is achieved by events such as Meetups and Thesis Fairs (which provide valuable networking opportunities with alumni and industry partners), an educational technical coordinator, and a dedicated physical meeting place. Students appreciate the sense of community within the programme, which embraces both full-time and part-time students. They recognize that part-time students may not always be able to attend social events but remain integral to the community. The panel believes that the coherence between part-time and full-time students should remain a point of attention, and is content that the programme management is aware of this. Also, the programme has its own dedicated room at the Science Park, which is prioritizes for educational activities of the programme. By realizing this, the programme has properly addressed the recommendation of the previous site visit to organize a dedicated workspace. Still, the growing student population can present challenges to maintaining this community cohesion. The panel encourages the programme to increase efforts and resources dedicated to fostering community and networking activities, in order to sustain student engagement and cohesion despite cohort growth.

The panel finds that the programme is feasible but challenging. The existence of preparatory programmes and tutoring helps students adjust, but a substantial number of students (fulltime and parttime) take longer than the expected duration. The one-year duration of the programme combined with parttime work or side job commitments places significant pressure on time management, particularly concerning course

workloads and the master thesis, which formally takes three months. Current efforts would benefit from a more proactive management approach and enhanced communication with students. The panel recommends developing and implementing a structured and proactive study planning and monitoring system for courses and the master thesis, and to improve communication channels with students to support timely progress and reduce delays. The recent initiative to create a Master Thesis Project tracking system is a positive step in this direction.

Teaching staff
The teaching staff is committed to delivering high-quality, research-informed education. It comprises one full professor, and multiple associate professors, assistant professors, senior lecturers, and junior lecturers. The programme also benefits from PhD students and junior lecturers who contribute to lab activities and who are supported by the faculty's Teaching and Learning Center. Teaching staff is actively engaged in research and industry collaborations, and they often combine academic roles with part-time industry positions. Most of the teaching staff hold formal teaching qualifications such as the University Teaching Qualification (UTQ) or the Senior Teaching Qualification (STQ).

The panel finds that the programme benefits from a high-quality and highly motivated teaching team embedded in diverse research groups. Many staff members are trained and have research publication records in relevant fields, enabling them to enrich the curriculum with current practical insights. The programme has responded adequately to the recommendation from the previous panel to hire more teaching staff and to embed teaching staff in appropriate research structures. The programme now has a robust team supported by four research groups, with a dedicated Educational Technical Coordinator role, and support from the Education Service Center in the form of a Junior Lecturer position to train professionals towards becoming higher-education teachers.

While staff numbers have increased since the previous visitation, the student staff-ratio is still considered high by the panel. The increasing student numbers necessitate further expansion of the teaching staff to sustain educational quality and provide the necessary supervision capacity. The panel suggests prioritizing recruitment and retention of additional qualified teaching staff, including permanent junior lecturer positions, to maintain favourable student-staff ratios and to support the growing cohort size. In addition, the panel suggests increasing the number of senior academic staff, as currently only one professor and two associate professors are involved.

Considerations
The panel appreciates the effective translation of the programme's intended learning outcomes into a coherent and well-structured curriculum. The one-year design successfully concentrates the broad field of software engineering. The curriculum thoughtfully balances theoretical foundations with practical application, and integrates hard technical skills alongside soft management-oriented competencies and research skills. Guest lectures from industry professionals and networking events enrich the learning experience and connect students to the professional field. Moving forward, the panel recommends continuously investing in updating the curriculum and incorporating emerging technologies and industry trends. In addition, strengthening the integration of societal and ethical considerations throughout the curriculum is seen by the panel as an opportunity.

The panel is positive about the programme's admission requirements, which are clearly defined and realistically aligned with the intended learning outcomes. The active teaching methods, appropriate guidance and support, feasible study conditions, justified use of English, comprehensive information provision, and adequate facilities for students with support needs, all contribute to a supportive and

student-centered learning environment, and help students navigate academic challenges and personal issues. The panel recommends developing and implementing a structured and proactive study planning and monitoring system for courses and the master thesis, and improving communication channels with students to support timely progress and reduce delays. The diverse and competent teaching staff uphold the programme's commitment to delivering high-quality, research-informed education. They benefit from their embedding in four diverse research groups, which allows staff to bring current practical insights into the curriculum.

Conclusion

The panel concludes that the programme meets standard 2.

Standard 3. Student assessment

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

Findings

System of assessment

The programme follows the examination and assessment policies as documented in the Teaching and Examination Regulations (TER), complemented by the Faculty of Science and Graduate School of Informatics assessment plans. These frameworks guarantee that assessments are valid and reliable, and that requirements are transparently communicated to students. The programme ensures that all assessment components directly contribute to the intended learning outcomes. Assessments incorporate a range of methods, from written tests to essays, reports, presentations, and lab work. The system of assessment encompasses multiple evaluation components per course, including individual assessments to ensure that students cannot pass solely based on group work. Formative assessments foster continuous student engagement and reflection, often requiring revisions based on detailed feedback from staff and peers. To maintain integrity, the programme employs plagiarism detection tools such as the Canvas automatic plagiarism check. Additionally, all assessment rules are established before the start of each course and are only changed under exceptional circumstances that benefit students.

For the graduation project, students pursue an independent research project under the guidance of an academic supervisor. The project often involves creating a prototype demonstrating feasibility and/or serves as a vehicle for experiments. Assessment is based on three independently assessed subjects: the research itself, a written thesis, and an oral presentation and defense. Graduation projects are supervised by an academic supervisor who appoints a defense committee including daily supervisors (from industry or academia) and an independent second reader. The defense is public, involving a presentation and scientific discourse, followed by deliberation where the research quality, thesis document, and oral defense are independently evaluated. A detailed assessment rubric aligned with faculty standards guides grading, and both the academic supervisor and second reader finalize the grade. The entire thesis process is managed via the DataNose system, ensuring transparency and structured documentation from proposal submission to grading.

Regarding the role of GenAI, the programme acknowledges the transformative potential of this technology in education while being mindful of the associated risks. The UvA has developed a policy framework guiding the deliberate and thoughtful integration of AI tools in education, and the Faculty of Science is actively developing faculty-specific policies. One of the faculty members has started an SKO project focused on the integration of GenAI in the programme, exploring how to incorporate GenAI tools responsibly and effectively in assessments and learning activities.

The panel came to understand that the UvA and the Faculty of Science have had a conservative approach toward GenAI in education. Recent developments show a more proactive stance, including pilot projects, policy frameworks, and the rollout of GenAI services such as the UvA Chat. The programme is engaging with the challenges and opportunities posed by generative AI in assessment through updating assessment policies and guidelines and through researching assessment implications. This reflects an understanding that the programme must adapt its assessment practices to maintain validity and reliability in the context of emerging AI technologies. The panel encourages the programme to continue working on clear and uniform procedures to address the use of GenAI. Additionally, maintaining a systematic record of all suspicious cases of fraud or plagiarism could strengthen academic integrity controls.

Based on the documentation and discussions during the site visit, the panel recognizes that the programme employs a robust and well-structured system of student assessment that supports the students' learning process. The programme ensures transparency in examination policies, course requirements, and assessment criteria from the outset. It applies a full palette of assessment techniques, including written exams, essays, reports, presentations, and lab work. This diversity in assessment methods supports the principles of validity and reliability by ensuring that students are evaluated comprehensively across different formats that suit the subject matter. Most assessments focus on competence and insight rather than pure knowledge, and many are formative to stimulate learning and reflection.

The panel understands that group projects are an integral part of the programme and important for developing collaboration skills. It assures the panel that each course features some individual assessments so that students cannot pass solely based on group work. However, the issue of free-riders remains a concern, as it affects team dynamics and perceived fairness in grading. Students and staff recognize the need for improved strategies to address this problem. The panel suggests to further develop and implement policies and procedures to identify and mitigate free-riding. These may include peer evaluations, individual assessments within group projects, and explicit communication of expectations.

Before the site visit, the panel reviewed fifteen thesis assessments. The panel considers the thesis assessment procedure to be thorough and careful. The assessment forms demonstrate good substantiation of the assigned grades, and the panel largely concurred with the grades awarded. The master thesis rubric is of good quality and detailed, and students are provided with extensive feedback. This supports a thorough and transparent evaluation of student performance. A recommendation of the previous site visit was to ensure that all thesis defense committees provide quality feedback to motivate their assessment and scores. The panel finds that the programme has successfully addressed this recommendation. Evaluation forms are now embedded in DataNose with minimum length requirements, and the programme regularly discusses with examiners the necessity of providing quality, motivated feedback. Moving forward, the panel invites the programme to consider improving the mechanisms to verify the independence of second examiners, especially in case of a hierarchical relationship between first and second examiner, and to further clarify procedures for resolving disagreements between examiners.

The panel observes that course evaluations and feedback mechanisms are used by the programme, yet sometimes students would like more timely or transparent feedback on assignments and exams. The panel suggests to better equip and support teaching staff in providing clear and timely feedback to students. Establishing shared best practices and intensified training for lecturers and teaching assistants could help close the feedback loop and enhance the students' learning experience.

Examinations Board

There is a faculty-wide Examinations Board at the Faculty of Science that oversees the quality of examinations and thesis projects for all programmes within the faculty. Within this faculty-wide board, there are subcommittees for individual programmes, including SE. The Examinations Board for SE appoints examiners for courses and thesis supervision, handles exceptions such as exemptions or additional exams, and addresses issues of plagiarism and fraud with a specialized subcommittee. The Board regularly reviews course assessments to ensure alignment with learning outcomes and regulatory adherence. The Board's oversight extends to quality assurance, supported by systematic procedures that utilize standardized course records to monitor examination quality.

The panel finds that the Examinations Board for SE fulfils its legal duties in a professional manner and is functioning effectively. It functions well and possesses the appropriate expertise to oversee the quality and fairness of assessments across the programme effectively. Support from teaching staff and course coordinators was suboptimal, but has improved over the years, among others by conducting systematic course evaluations. This has led to better detection and resolution of issues during courses. The Board demonstrates a commitment to maintaining assessment quality, actively reviewing all course assessment plans, taking into account the opportunities and pitfalls of GenAI. The panel advises the Board to set clear and uniform procedures for GenAI-based fraud and to keep track of all suspicious cases.

Considerations

The panel is content with the programme's sound assessment framework, with clear principles of validity, reliability, and transparency that are well reflected in the programme's assessment practice. The master thesis assessment is detailed and constructive. The presence of regular feedback meetings with students is viewed positively, and the panel encourages continuation of this practice. The programme's proactive stance toward the challenges posed by generative AI underscores its commitment to maintaining academic standards and assessment integrity in a changing educational landscape. The panel recommends continuous attention for clear and uniform procedures to address the use of GenAI, and to maintain a systematic record of all suspicious cases. It pleases the panel to see that the Examinations Board is proactively reviewing all course assessment plans, and that support for the Board has improved.

Conclusion

The panel concludes that the programme meets standard 3.

Standard 4. Achieved learning outcomes

The programme demonstrates that the intended learning outcomes are achieved.

Findings

Theses

The panel studied a selection of theses from the period 2023-2024, twelve from students in the fulltime and three from students in the parttime variant. The panel finds that the quality of the theses produced by students in both variants are generally very good. The panel notes that many theses lead to scientific publications, which demonstrates a strong research underpinning within the programme. This output is a mark of quality and indicates that the theses meet a high academic standard. The panel suggests to better align certain theses with the core domain of software engineering, as some thesis topics were on more general computer science topics, and could better reflect the software engineering discipline. Doing so would help maintaining the distinct identity of the software engineering programme. Also, the panel sees an

opportunity to improve the societal and ethical reflections in the theses, for instance by explicitly incorporating these dimensions into the master thesis requirements.

Performance of graduates
The programme supports its graduates in transitioning effectively into the professional field or further academic pursuits. Many students publish or present their graduation project work at national and international scientific venues. Graduates from the programme demonstrate high employability, with a substantial number completing their graduation projects in industry receiving immediate job offers from their host companies. Most graduates land junior position in the software engineering field. Although the programme explicitly aims to prepare students for academic careers, only a small fraction currently pursue doctoral studies. This is consistent with the broader trend in the academic job market for computer science, where Dutch applicants for PhD and postdoctoral positions are generally scarce.

Based on the documentation and discussions during the site visit, the panel finds that graduates are well-prepared for diverse career paths, typically finding employment in software engineering. The demand for SE graduates attests to the practical relevance and quality of the education they receive, and to the value of their master's degrees. Alumni indicate general satisfaction with the programme, and are content with the high academic quality and research orientation of the programme. They also highlight the complexity of the courses, their direct relevance to real-world applications, the combination of hard and soft skills, and the exposure to multiple programming languages, tools, and diverse contexts, which combined provide a well-rounded and practical learning experience. Alumni have shared valuable tips for improving the programme, such as increasing the number of practical, hands-on courses, incorporating more content on software architecture and high-level design thinking, and introducing international students to the Dutch grading system early on to help them better understand academic expectations and assessment standards. The panel suggests the programme to take these ideas into account.

Considerations
The panel is content to see that the students achieve the intended learning outcomes of the programme. This is confirmed by the quality and relevance of thesis projects, and the positive performance of graduates in both professional practice and postgraduate education. It pleases the panel to see that several thesis projects result in scientific papers.

Conclusion
The panel concludes that the programme meets standard 4.

General conclusion
The panel's judges that the master's programme meets all four standards. The panel's assessment of the programme is therefore positive.

Recommendations
1. Update the intended learning outcomes in view of GenAI developments.
2. Continuously invest in updating the curriculum and incorporating emerging technologies and industry trends.
3. Strengthen the integration of societal and ethical considerations throughout the curriculum, with particular attention to embedding these aspects explicitly in the master thesis projects.
4. Develop and implement a structured and proactive study planning and monitoring system for courses and the master thesis, and improve communication channels with students.

5. Continue working on clear and uniform procedures to address the use of GenAI, and maintain a systematic record of all suspicious cases of fraud or plagiarism.

Appendix 1. Intended learning outcomes

1. Graduates are familiar with the most relevant theories, methods and techniques in the domain of Software Engineering.

2. Graduates have the necessary background knowledge to familiarize themselves with novel methods and techniques for life-long learning.

3. Graduates can successfully apply theory in practice in order to find innovative solutions for both general and domain-specific software engineering problems.

4. Graduates can make valuable contributions to complex software engineering projects through the independent and critical application of academic knowledge and skills.

5. Graduates have sufficient technical understanding and intellectual capacity to play, after some years of practical experience, a managerial or advisory role in software engineering.

6. Graduates can clearly report their findings, both in oral and in written form, and can explain problems at an audience-focused level of abstraction.

7. Graduates have research skills at the academic level and are capable to autonomously perform research in the domain of software engineering.

8. Graduates understand why user needs are difficult to express, capture and understand and graduates are familiar with best practices in requirements engineering as well as their shortcomings.

9. Graduates are able to produce formal specifications of modest-sized samples of software and to use them for the generation of meaningful tests; they understand the essential concepts of software verification.

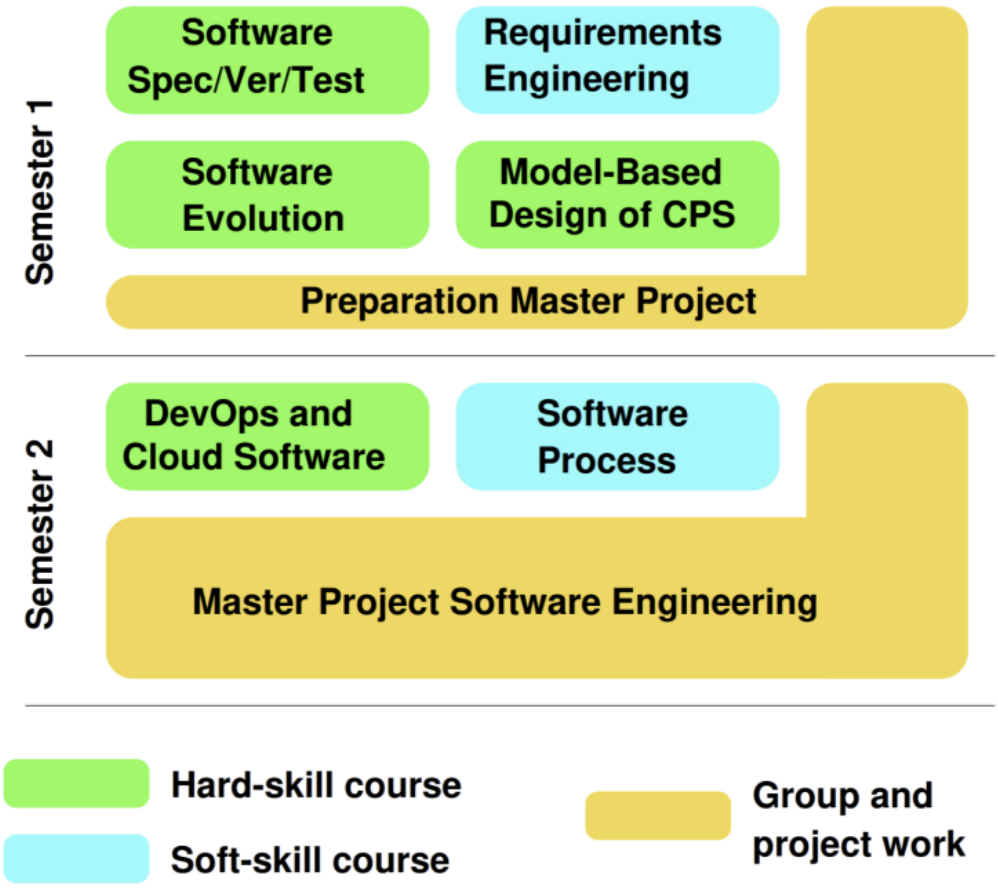
10. Graduates master the methods and techniques for analyzing existing software systems and their evolution in the context of changing requirements.

11. Graduates are familiar with the characteristics of software for embedded systems and know how to accommodate these characteristics in the software design and development phases.

12. Graduates understand why big software projects are prone to failure and are familiar with software engineering process models, their situation-awareness and their general shortcomings.

13. Graduates are familiar with the concept of DevOps and their benefits for organizational IT infrastructure and services management; they understand how to build cloud-based applications and how to use cloud automation tools across a wide range of application scenarios.

Appendix 2. Programme curriculum



Appendix 3. Programme of the site visit

Wednesday 26 November

09.30-10.00	Welcome
10.00-10.30	Preliminary discussion panel
10.30-11.30	Programme management BSc Informatica, MSc Computational Science, MSc Software Engineering
11.30-12.15	Interview BSc Informatica students and alumni
12.15-13.15	Lunch
13.15-14.00	Interview BSc Informatica teaching staff
14.00-14.30	Internal deliberation panel
14.30-15.15	Interview MSc Computational Science students and alumni
15.15-16.00	Interview MSc Computational Science teaching staff
16.00-16.30	Internal deliberation panel
16.30-17:00	Q&A programme management BSc Informatica, MSc Computational Science

Thursday 27 November

08.45-09.15	Welcome and preliminary discussion panel
09.15-10.00	Interview MSc Software Engineering students and alumni (fulltime and parttime)
10.00-10.45	Interview MSc Software Engineering teaching staff
10.45-11.15	Internal deliberation panel
11.15-12.00	Interview Examinations Board
12.00-13.00	Lunch
13.00-14.00	Thematic session 1
14.00-15.00	Thematic session 2
15.00-15.30	Final management interview
15.30-16.30	Internal deliberation panel
16.30-17.00	Feedback from the panel

Appendix 4. Materials

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

The panel also studied other materials, which included:

- Reading guide and roadmap
- SWOT Analysis
- Student chapter
- Report previous visitation
- Yearly report Examinations Board
- Yearly report Programme Committee
- TER 23-24
- Curriculum overview
- Minutes Professional Advisory Board
- Alumni survey results
- List of teaching staff and examiners
- List of external teaching staff
- Thesis assessment rubric
- Assessment plan
- Thesis supervisor manual
- Graduation project student manual
- Study guide
- Alumni survey
- Course materials for a select number of courses