INITIAL ACCREDITATION

ACADEMIC MASTER
COMPLEX SYSTEMS AND POLICY

University of Amsterdam

Content

1   Peer Review

The Accreditation Organisation of the Netherlands and Flanders (NVAO) assesses the quality of a new programme through a peer review process. This initial accreditation is mandatory for an institution that seeks to award a recognised degree upon the successful completion of a study programme.

The procedure for accrediting new programmes differs somewhat from that for existing programmes that have already been accredited. Initial accreditation serves as an ex ante assessment of a programme's quality. Once accredited, the new programme becomes subject to the standard review process for existing programmes.

The quality of a new programme is assessed by means of peer review. A panel of independent peers, including a student, reviews the plans during a site visit to the institution. A discussion amongst peer experts forms the basis for the panel's final judgement and advisory report. The focus is on the curriculum, the teaching and learning environment, and student assessment. The agenda for the panel visit and the documents reviewed are available from the NVAO office upon request.

The peer review outcome is guided by the standards outlined and published in the NVAO Assessment framework for the higher education accreditation system of the Netherlands (Staatscourant 2024, nr. 6405). Each standard is evaluated on a three-point scale: meets, partially meets, or does not meet the standard. Based on this evaluation, the panel will rate the programme's overall quality as positive, conditionally positive, or negative.

NVAO makes the decision on the programme's quality based on this advisory report. This accreditation decision can be positive, conditionally positive or negative. If the decision is positive, with or without conditions, the institution may proceed to offer the new programme. Graduates of the programme will then be entitled to receive a legally accredited degree.

This report presents the panel's findings, analysis and judgements resulting from the peer review. It also details the commendations and recommendations for follow-up actions. A summary report highlighting the main outcomes of the peer review is also available.

Both the full and summary reports of each peer review are published on NVAO's website www.nvao.net. There you can also find more information about NVAO and peer reviews of new programmes.

2 New Programme

2.1 General data

Institution	University of Amsterdam
Programme	Academic Master Complex Systems and Policy
Variants	Fulltime
Degree	Master of Science
Tracks	n/a
Locations	Amsterdam
Study load	120 EC[1]

2.2 Profile

The MSc Complex Systems and Policy is a two-year full-time academic master's programme (120 EC, NLQF level 7) offered by the University of Amsterdam. Reflecting the international nature of the professional field and the global societal context, the programme is offered in English. The anticipated student intake for the inaugural year is approximately 40 students.

The programme aims to develop socially responsible professionals, adept at integrating complexity science with policy-oriented disciplines. Graduates will be equipped to connect technical expertise with policymaking, preparing them for roles such as researchers, analysts, and policy advisors in both national and international settings. By aligning with emerging industry needs, the programme focuses on producing professionals who can work with diverse stakeholders to translate technical insights into practical policies.

Offered by the Faculty of Science in close collaboration with the professional sector, the MSc in Complex Systems and Policy addresses key domains such as sustainability and health as well as applied scientific research.

2.3 Panel

Peer experts
1. Dr. Carina Wiekens (chair)
   Lector Communication, Behaviour & Sustainable Society, Lector EnTranCe-Centre of Expertise Energy, Hanze University of Applied Sciences Groningen, The Netherlands
2. Prof. dr. Karoline Wiesner
   Professor of Complexity Science at the Department of Physics and Astronomy, University of Potsdam, Germany
3. Prof. dr. Frank Boons
   Professor of Political Economy of Sustainability, School of Business and Economics; Director, Maastricht Sustainability Institute (MSI), Maastricht University, The Netherlands
4. Anne van de Rijdt (student)
   Recently graduated from the Master's programme Master Social Challenges, Policies and Interventions, Utrecht University, The Netherlands.

Assisting staff
Yulia Krijthe MA, Ed.M., secretary
Anne Klaas Schilder MA, NVAO policy advisor and process coordinator

Site visit
Amsterdam, 18 October 2024

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[1] European Credits

3   Outcome

The NVAO-approved panel reached a positive conclusion regarding the quality of the academic master's programme Complex Systems and Policy (CS&P) offered by University of Amsterdam (UvA). The programme meets all standards of the NVAO framework.

The MSc in Complex Systems and Policy (CS&P) addresses the growing complexity of societal challenges through interdisciplinary and transdisciplinary approaches. It equips students with a strong foundation in complexity science, integrating fields such as data science, computer modelling, economics, governance, ethics, and decision-making. Focusing on health and sustainability, the programme aims to develop cross-disciplinary professionals who bridge technical knowledge and policymaking, preparing graduates for roles as researchers, analysts, and policy advisors in both national and international contexts.

Stakeholder feedback confirms the programme's relevance, emphasising its goal of training professionals who can connect technical expertise with actionable policymaking. The panel finds that the programme's exit qualifications are well-defined and aligned with its educational and professional objectives. It recommends further refinement of the professional profile to enhance the international orientation.

The panel acknowledges the programme's well-developed and viable didactic approach, offering collaborative learning opportunities through workshops, real-life case studies, and simulations with external stakeholders. Challenge-based learning facilitates the application of acquired knowledge and transdisciplinary skills. The panel suggests explicitly defining the international content and learning outcomes to strengthen the programme's global focus, including the involvement of international stakeholders in challenge-based projects.

The curriculum is balanced, combining core and elective courses with transdisciplinary projects, and offers opportunities for knowledge deepening through a final thesis that integrates transdisciplinary research and practical application. The panel recommends defining transdisciplinary skills in course content and literature. They also emphasise the need for balanced preparation among all students, regardless of their prior studies, by reviewing student entry levels, including international intake, clearly articulating prerequisite knowledge for admission, and specifying available bridging or remedial options. Overall, the curriculum reflects the programme's vision, enabling students to develop a broad skill set aligned with the graduate profile. With well-equipped facilities and strong student support services, the programme provides a conducive learning environment. The staff's expertise and commitment are evident, and the assessment methods used to evaluate students are varied, ensuring quality. The programme's two-year duration (120 EC) aligns with international standards and the comprehensive curriculum, and the panel supports the argument for this duration to adequately prepare graduates for the competitive job market.

In conclusion, the panel is convinced of the quality of the proposed programme and trusts that the UvA MSc Complex Systems and Policy will be a robust, academically feasible programme.

Standard	Judgement
1. Intended learning outcomes	meets the standard
2. Teaching-learning environment	meets the standard
3. Student assessment	meets the standard
Conclusion	**positive**

4   Commendations

The programme is commended for the following features of good practice.

1. Professional Orientation – The UvA Master's programme in Complex Systems and Policy introduces an innovative focus, preparing future professionals with the transferable skills needed to connect technical expertise with practical policymaking. The programme aims to cultivate adaptive, socially responsible individuals who can analyse complex societal challenges and develop evidence-based, impactful interventions.

2. Interdisciplinary Integration **–** The programme effectively integrates diverse disciplinary perspectives and actively engages non-academic stakeholders, fostering a holistic and collaborative learning environment.

3. Rigorous Curriculum Structure – The curriculum is designed with clear and well-defined learning outcomes, built on strong academic research foundations. It integrates challenge-based teamwork, aimed at expanding and enriching the students' learning experience, while effectively balancing disciplinary depth with inter- and transdisciplinary knowledge and skills.

4. Collaborative Development – The programme is the result of a collective effort by highly qualified academic staff, interdisciplinary scholars, and programme management. This dedicated team has created a rigorous and academically feasible curriculum, fostering a close-knit, supportive community that is essential to the programme's success.

5. Comprehensive Assessment Programme – The intended curriculum incorporates a diverse and well-rounded range of assessment methods, ensuring a balanced and comprehensive evaluation of students' knowledge and skills.

5   Recommendations

The panel recommends several follow-up actions to improve the programme further. These recommendations do not detract from the positive assessment of the programme's quality.

1. Enhancing International Orientation – Strengthen the programme's international ambitions by explicitly integrating them into the intended learning outcomes, thereby ensuring a more pronounced emphasis on international orientation.

2. Global Engagement in Curriculum – Clearly articulate the international components of the curriculum and actively engage international stakeholders in challenge-based projects to enrich the learning experience.

3. Stakeholder Alignment in Curriculum Design – Continuously assess the expectations of key stakeholders, especially in data science and statistical fields, and incorporate their insights into the curriculum to ensure its relevance and alignment with industry needs.

4. Transdisciplinary Approach – Strengthen the transdisciplinary focus as a core component of the curriculum. Integrate advanced technical and interpersonal skills into the course content and literature to support a transformative learning experience of the change-making learning trajectory and ensure the achievement of intended learning outcomes.

5. Harmonising Admission Criteria – Reevaluate the intake criteria and required prior knowledge for all students, including international applicants, to ensure alignment with programme expectations. Clearly specify prerequisites and selection procedures and provide details on bridging or remedial options for students who do not meet direct admission requirements.

6   Assessment

6.1   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.

Judgement
Meets the standard.

Findings, analysis and considerations

The objective of the Master's programme in Complex Systems & Policy (CS&P) is to educate students in Complexity Science by integrating knowledge, methods, and skills from analytical disciplines such as Data Science, Computer Science (modelling), and Economics with those from Behaviour, Governance, Policy, and Ethics. These interdisciplinary and transdisciplinary approaches are essential for developing new methods and perspectives to understand complex systems, address intricate societal issues in the domains of health and sustainability. The programme aspires to educate students in these areas. The proposed programme is built on the UvA's well-established profile in interdisciplinary education and is managed by the Institute for Interdisciplinary Studies (IIS).

Graduates of the MSc in Complex Systems and Policy will specialise in analysing complex societal issues, equipped with the skills to integrate complex systems methods into policymaking and analysis. As academically trained professionals, they will have diverse career opportunities in both national and international contexts, including roles as researchers, analysts, and policy advisors. With a broad range of knowledge and skills, they will bridge the gap between data analysis and policy, leveraging their technical expertise to collaborate with IT professionals and their social insights to work effectively with policymakers and implementers.

As data analysts, they will model complex societal challenges and develop innovative solutions or interventions, potentially working at think tanks, statistical bureaus, or government agencies. With their interdisciplinary knowledge and experience working in diverse teams, graduates may also pursue careers in academia or applied scientific research institutions, such as TNO, tackling urgent societal issues. In these roles, they will advise on decision-making processes, propose transparent interventions, and assess the impact of policy initiatives using data, models, simulations, and experiments. The programme's integration of diverse disciplinary insights and active involvement of non-academic stakeholders has been highly commended by the panel.

Upon reviewing the application dossier, the panel raised questions about whether the field of complex systems and policy implications constitute an established labour market with strong connections. However, discussions with programme management and industry representatives reassured the panel that graduates of this master's programme would secure positions within their respective fields. The industry representatives emphasised a strong demand for policy advisors capable of translating technical outcomes into actionable policy proposals, with

opportunities available at various levels of government and within advisory agencies. Moreover, the growing career prospects at the intersections of the programme's core areas, also for international alumni, further validate the programme's relevance and the expanding job market in this domain.

The panel gathered from the programme dossier that the requirements of the professional field were considered during the programme design process. This was further confirmed in discussions with several industry representatives, who have been involved since the programme's inception. The panel met with professionals from various sectors, including a manager from Public Health Service Amsterdam (GGD), a methodologist from the Central Bureau for Statistics (CBS), a senior policy advisor from the Dutch Scientific Climate Council (WKR), a principal scientist from Netherlands Organisation for Applied Scientific Research (TNO), and a post programme manager from Polder interdisciplinary research network (IAS, UvA). Their insights and experiences provided valuable perspectives on the programme's alignment with industry needs and the career prospects for graduates. The panel found the representatives to be highly supportive of the master's programme. However, they identified a discrepancy between the programme's envisioned inter- and transdisciplinary graduate profile and the expectations of industry stakeholders, particularly in the fields of statistics and data science. To address this gap, the panel recommends that the programme actively monitors and engages with industry expectations, ensuring that insights from key stakeholders are incorporated into the curriculum. This approach will help align the programme more closely with industry needs, thereby enhancing the career prospects of its graduates and maintaining the programme's relevance in a rapidly evolving job market.

The panel appreciates the thoughtful approach taken to define the professional orientation as complementary to the academic focus. While there was extensive involvement of national stakeholders, the panel found limited evidence of the programme's international aspirations in relation to the envisioned educational profile. Therefore, the panel recommends that the programme more clearly articulate its ambitions for internationalisation and ensure that both the curriculum and intended learning outcomes align with this international focus.

The programme's profile has been translated into 11 intended learning outcomes (ILOs), also referred to as exit qualifications. The panel reviewed the design process for formulating these exit qualifications based on the information provided in the dossier. To gain a more comprehensive understanding, additional clarification was sought during the site visit, and the mapping of the programme's ILOs was provided upon request. Based on the substantiation received, the panel has established that the ILOs are formulated in accordance with the Dublin Descriptors at the master's level and align with the Dutch National Qualifications Framework (NLQF level 7).

The learning objectives are linked to intermediate learning trajectories that contribute to the exit qualifications, with an appropriate distribution of emphasis across areas such as data and modelling, policy and decision making, change-making, and academic research. These intermediate learning trajectory outcomes act as milestones, guiding students toward achieving

the exit qualifications. The panel confirms that this structure effectively aligns the curriculum with both the intended learning outcomes and industry expectations.

In developing its intended learning outcomes (ILOs) and curriculum, the programme drew on insights from other relevant Master's programmes both within the Netherlands and internationally. These programmes share the common objective of educating students in the interdisciplinary analysis of complex challenges. During discussions with the programme management, the panel learned that the market benchmark analysis had helped the programme sharpen its own profile. By incorporating insights and best practices from these programmes, the programme has established a sound educational framework that equips students to navigate the complexities of inter- and transdisciplinary research and problem-solving.

Based on discussions with programme and industry representatives along with the materials provided, the panel concludes that the programme's profile is built on a clear and distinctive vision, generally aligning well with the expectations of the professional field. The panel supports the programme's interdisciplinary and transdisciplinary approaches, as well as its ambition to educate professionals who are well-prepared to address the growing complexity of societal challenges. This is achieved by integrating knowledge of public policy with data modelling skills and expertise in sustainability and health domains. Graduates, envisioned as boundary spanners, will be able to translate modelling outcomes into tangible policy recommendations. The panel recommends further refining the formulation of the CS&P profile to explicitly highlight its international orientation. The panel ascertains that the programme's intended learning outcomes are formulated based on the specific descriptors of the Dutch Qualifications Framework (NLQF) at level 7 and are aligned with the Dublin Descriptors at the master's level.

Based on these findings and considerations, the panel concludes that the intended programme meets standard 1.

6.2   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.

Judgement
Meets the standard.

Findings, analysis and considerations

Curriculum and Teaching-learning environment
The Master's programme extends over two years, encompassing a total of 120 EC. In accordance with the University of Amsterdam's academic calendar, the courses and projects are organised into 8-8-4-week timeslots per semester. The curriculum includes core courses in complexity theory, data and modelling, and policy intervention design, amounting to 42 EC,

which are compulsory for all students and provide the theoretical foundation. In addition to the core courses, the first year emphasises two semester-long challenge-based projects, totalling 36 EC, which run parallel to the foundation courses. These projects allow students to directly apply the knowledge and skills gained in the concurrent courses to a project focused on a sustainability or health challenge framed by an external partner organisation. Additionally, they function as educational platforms for acquiring the essential tools to tackle specific challenges. Challenge-based Project I emphasises computational modelling and simulation, laying the groundwork for analysing the overall challenge. Challenge-based Project II focuses on experimentation and intervention implementation, allowing students to build upon the work initiated in the preceding project.

Throughout the challenge-based projects and the final capstone graduation project, students develop the ability to provide and integrate constructive feedback from peers, mentors, and stakeholders, enhancing the quality of their work. They also gain proficiency in project management techniques that facilitate interdisciplinary collaboration. These projects require students to reflect on their ongoing work and progress through videos and reflection essays, contributing to their personal and professional development. The panel recognises the challenge-based approach as a key strength of the programme and encourages ongoing collaboration to continuously optimise the curriculum in response to emerging societal challenges, industry developments (both national and international), and interdisciplinary advancements.

The curriculum structure follows the didactic concepts of constructive alignment, with course learning outcomes explicitly linked to the programme's intended learning outcomes (ILOs). The panel reviewed the first-year course information and only an outline of the second year, leading to uncertainty about the vertical integration of programme learning outcomes and the progression of course content. Additionally, the panel was unsure about the international elements of the curriculum. This concern was partially addressed during the site visit, which demonstrated a logical progression of content with thematic cohesion and increasing complexity throughout the prospective courses and projects. Given the international orientation of the programme and the plan to enrol international students, the panel was unable to gain comprehensive insights into the extent of the international curriculum component from the information provided. In discussions with invited professionals and programme representatives, the panel did not receive adequate elaboration or compelling examples of international input designed to benefit students engaged in challenge-based projects and the final graduation project. The panel believes that such input is crucial for ensuring global relevance, thereby enhancing the impact and applicability of project outcomes across different contexts.

When questioning lecturers about the international context of the programme components, the panel did not receive enough substantiation or examples of prospective international industry commissioners or international contexts within course components. Lecturers mentioned their international networks engaged during interdisciplinary research, which could be leveraged for the Complex Systems and Policy curriculum. The panel finds these responses too conceptual and recommends explicitly defining the international content of the curriculum

and specific learning outcomes to reflect the programme's international orientation. Specifically, the panel suggests including international stakeholders in challenge-based projects. Their diverse perspectives and expertise can enrich the problem-solving process, leading to more innovative solutions that students can integrate and adapt.

Regarding the curriculum structure in Year 2, students take advanced courses and can select two elective courses, contributing a total of 12 EC, to further tailor their expertise in their thematic focus areas (sustainability or health). The programme culminates in a 30 EC transdisciplinary graduation research project, conducted in partnership with an external stakeholder organisation. Drawing from the curriculum structure and site visit insights, the panel trusts that students will be well-prepared to make informed choices for their graduation research.

Considering the curriculum materials and insights from the site visit, the panel finds that the programme offers students significant freedom to develop their professional profiles. The programme prioritises training future academic professionals to address complex societal challenges within interdisciplinary and transdisciplinary contexts, equipping them with the capability to integrate complex systems methods into policymaking and analysis. However, despite these strengths, the panel was unable to determine from the reviewed course materials and suggested literature how exactly the concept of transdisciplinarity has been embedded in the curriculum and which pertinent skills are intended to be developed for conducting transdisciplinary research.

While the information provided through intensive discussions with programme representatives was adequate, the panel recommends standardising the focus on transdisciplinarity and its integration into the curriculum. This includes incorporating transdisciplinary skills—a set of higher-order technical and interpersonal skills that go beyond mere communication and negotiation with stakeholders. The curriculum content and course literature should ensure the development of essential transdisciplinary skills, such as engaging with stakeholders to jointly define relevant problems and co-create actionable knowledge. This comprehensive approach, which includes integrative thinking, complex reasoning, and systems thinking, will facilitate the achievement of intended learning outcomes within the change-making learning trajectory.

Through a variety of instructional methods relevant to the four learning trajectories of the curriculum, the programme offers a commendable teaching-learning environment. Some examples include:

1. Foundational Coursework: Lectures and hands-on exercises in complexity theory, systems dynamics, and mathematical modelling.
2. Projects and Research: Application of modelling and data integration skills through challenge-based projects and research activities addressing real-world problems.
3. Case Studies and Simulations: Exploration of organisational theories, behavioural science, and policymaking processes.

4. Workshops and Simulations: Enhancement of cross-cultural communication skills through external stakeholders' interactions and interactive workshops.
5. Interactive Learning: Engagement in real-world projects, peer feedback, and coordination of multi-stakeholder projects.

The panel is convinced that the various types of instruction used throughout the MSc Complex Systems & Policy programme will provide a comprehensive and practical learning experience. This approach prepares students to tackle complex societal challenges and supports the implementation of transdisciplinary, challenge-based educational principles.

Staff
The CS&P courses are delivered by international senior academic staff from various faculties, including Science, Social and Behavioural Sciences, Economics and Business, Law, UMC, and Humanities. During the site visit, the panel met the teaching staff responsible for developing the CS&P curriculum. This team displayed a great collaborative spirit and a passion for the disciplines to be taught in the MSc Complex Systems and Policy. The panel notes from the information dossier that teaching staff of the involved faculties receive systematic training in didactic and assessment skills through the University Teaching Qualification (UTQ) or Senior Teaching Qualification (STQ). Conversations with the lecturers revealed that regular development team meetings took place throughout the programme's design. The panel encourages the continuation of these calibration meetings to ensure better alignment of the various curriculum components.

From the provided excerpts of staff profiles, it has become clear that all prospective academic hold positions as assistant professors, associate professors, or full professors and are internationally recognised for their interdisciplinary research, as shown by their publications and (inter)national collaborations. They are supported by experienced lecturers with PhDs and postdoctoral researchers. The programme's embedding in the research of the Institute for Advanced Study (IAS) will guarantee continuity of staff. Dedicated funds for quality education enhancement are already in place, allowing also for the recruitment of new staff. Additionally, the IAS fellowship programme will enable the inclusion of a diverse range of (international) guest lecturers who will contribute their expertise in sustainability and health. Following discussions with the programme development team, the panel was convinced that the faculty had sufficient staff capacity and a broad spectrum of expertise to realise the curriculum. The panel considers the programme management and teaching staff well-prepared to carry out and coordinate the overall programme.

Language of Instruction and Programme Name
The Master's programme in Complex Systems and Policy is conducted in English to align with the international nature of the field and the prominence of global research networks. Within the field of complex decision-making, English is the standard language, with textbooks and other materials often only available in English. This ensures that students aiming for scientific careers and those tackling global health and sustainability issues are proficient in English. The programme fosters collaboration in international teams, thereby enhancing the learning experience and preparing graduates for global professional environments, where English is

often the working language. While English is the primary language of instruction, the programme accommodates communication in both English and Dutch, allowing students to complete their graduation projects in Dutch with a Dutch partner. The panel supports this decision but advises ensuring that non-Dutch-speaking students have equal opportunities to participate in projects that align with their interests, just as their Dutch-speaking peers do. Overall, the panel agrees that English is the logical choice as the main language of instruction for the Complex Systems and Policy Master's programme. Consequently, the panel also supports the English name of the programme.

Intake
Based on the admission programme details, the panel has determined that applicants with a bachelor's degree or its equivalent from various fields can be admitted to the CS&P programme. To qualify, applicants must have:

- 60 EC in natural sciences or social sciences and 30 EC in either of these specified sciences, or
- 60 EC in humanities and at least 30 EC in natural sciences and 30 EC in social sciences.

Graduates from UvA bachelor's programmes including Beta-Gamma, Future Planet Studies, Information Science, and Amsterdam University College, as well as the new Computational Social Science and Future Science, Technology and Innovation programmes can be directly admitted to the programme. Since the programme is taught in English, applicants must demonstrate a strong command of the language, with at least a C1 level according to the CEFR.

The session with the programme management and teaching staff expressed a preference for a diverse cultural and international intake to enhance the students' learning experience. This diversity aims to create optimal conditions for working in multidisciplinary teams and jointly acquiring new knowledge, which is essential for achieving the intended learning outcomes. While the panel supported the programme's desire for a diverse student group, they had concerns about whether the intake procedure adequately specified the expected technical skill set for applicants with a social sciences background, who may lack prior knowledge of programming (e.g., Python) or have limited experience in mathematics and statistics. Additionally, lecturers noted that harmonising entry levels could be challenging. Students with higher prior technical knowledge might become less engaged in foundational courses (e.g., Model-Based Decision-Making). The intensive conferring with the programme representatives elucidated some available bridging and remedial practices used with the IAS programmes, such as self-study packages for individual knowledge gaps offered over the summer, extra remedial teaching in particular subjects based on cohort demand, and providing tools (e.g., notebooks) and additional lab work to help students progress alongside their peers.

Further explanations from the programme representatives revealed that the programme was aware that students from different disciplinary backgrounds might not have the necessary and consistent levels of knowledge and skills. The panel stressed that the programme should strive to achieve a balanced and appropriate level of preparation among all students, irrespective of their prior studies. Therefore, the panel recommends a thorough review of the alignment of

student entry levels, including international student intake, and a clear articulation of the prerequisite knowledge required for admission. Additionally, the panel suggests specifying any available bridging or remedial options for prospective students.

Furthermore, the panel has learned that students will receive tailored guidance, coaching, and counselling throughout the programme. The combination of senior tutors, who are experienced lecturers with PhDs, and study advisors provides comprehensive support. Senior tutors, each responsible for a group of 20 students, play a crucial role in supervising, coaching, and guiding students through their academic and professional development, particularly during challenge-based projects and the final graduation project. Their expertise ensures personalised attention and supervision. Study advisors, on the other hand, are key contacts for academic guidance, staying informed about legal regulations, organising information meetings, providing career information, and offering support for personal issues affecting study progress. The panel appreciates this dual support system, which appears well-designed to help students succeed both academically and professionally.

In summary, the panel believes that the programme provides a conducive teaching and learning environment. The curriculum structure is overall coherent and viable, offering an attractive combination of core and elective courses, as well as challenge-based projects, and is primed for implementation by highly qualified staff. The study load is appropriately distributed over two years, setting up a manageable workload. While the programme content sufficiently reflects the distinctive profile of the proposed programme, there is potential for further development particularly in enhancing its international focus and reinforcing its transdisciplinary approach. Additionally, it was concluded that harmonising courses to accommodate a diverse student intake is desired, and balanced preparation for all students should be ensured by evaluating entry levels, including international students, defining prerequisite knowledge, and tailoring bridging or remedial options.

Strong elements of the programme include its use of activating teaching methods based on inquiry- and challenge-based learning, which facilitate the development of students' transdisciplinary skills and encourage student ownership of both personal and professional growth. Overall, the panel concludes that the curriculum, student guidance services, and the quality of the teaching staff will enable incoming students to achieve the intended learning outcomes. Therefore, the panel deems standard 2 as met.

6.3   Standard 3: Student assessment

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

Judgement
Meets the standard.

Findings, analysis and considerations

The proposed master's programme in Complex Systems and Policy has created an assessment system that complies with the principles and procedures for designing, organising,

administering, and evaluating assessments as outlined in the Framework Assessment Policy UvA (2022) and the IIS Assessment Policy Plan (2024).

The panel examined a draft of the CS&P Assessment Plan, which outlines the alignment between exit qualifications and course-level intended learning outcomes, summarises the assessment methods used in various CS&P courses, and details the programme curriculum. During the site visit, the Examinations Board (EB) confirmed that lecturers would be required to follow the CS&P Assessment Plan in their teaching and assessment practices.

Aligned with the IIS Assessment Policy Plan the programme has delivered the CS&P assessment programme that offers an overview of summative assessments and includes assessment matrices that detail which programme ILOs are assessed in each course throughout the proposed two-year duration.

From the assessment policy documents and further explanations during the site visit, the panel determined that the assessments in CS&P courses embody the programme's transdisciplinary and challenge-based approach, focusing on evaluation methods that prioritise process and skill development. Assessment choices are primarily guided by the course ILOs, which follow a progression through Bloom's taxonomy. While all forms of assessment are integrated throughout the programme, early courses emphasise assessment-for-learning, whereas later courses prioritise assessment-of-learning. For example, initial courses focus more on measuring knowledge and understanding through written exams, quizzes, and presentations. They also include elements that apply this knowledge via papers and research proposals. The challenge-based components of the curriculum emphasise assessment-as-learning, using skill-based assessments closely tied to practical application, focusing on applying knowledge, analysis, and evaluation. Throughout the programme, multiple assessors from diverse academic expertise areas collaborate to evaluate the transdisciplinary nature of the challenge-based projects. Overall, lecturers have received training in creating diverse assessment forms and formats.

The programme employs a functional range of assessment forms, including written assignments, group presentations, model creation, research reports, and creative assignments such as video or poster presentations, along with various forms of reflection or peer work. The assessment programme also includes test formats based on individual and group participation. Group work includes process supervision and assessment of individual contributions, along with peer feedback and evaluation of each student's performance. The panel observed the frequent use of group assessments in the curriculum and inquired how the Examinations Board would ensure that individual students achieve the programme learning outcomes. The Board explained that the programme would implement declarations of individual learning trajectories, requiring students to assume different roles in various projects to ensure comprehensive individual assessment. This explanation was sufficient to address the concern. However, the panel recommends implementing additional strategies to ensure that each student develops their skills and meets the ILOs, even within a group project setting.

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From the discussions with the programme development team and the Examinations Board, the panel confirms that the programme ensures sufficient transparency in the planned assessment of each course and challenge-based projects.

After reviewing the course templates of the first-year curriculum and relevant assessment materials, the panel determined that the assessments are consistent with the course-level learning outcomes, which correspond to the learning trajectories, and are mapped to the programme-level Intended Learning Outcomes or exit qualifications. The panel appreciates the uniform use of assessment grids across the courses presented.

The course templates and assessment grids provided specify the types and formats of assessments, along with evaluation criteria that correspond to the intended learning outcomes. Grades reflect both group and individual student performance levels. The panel noted that reliability and validity are enhanced through several measures: examiners follow the assessment cycle and use the 'four-eyes' principle when designing summative assessments based on assessment matrices. Additionally, student deliverables are regularly reviewed and discussed among teaching team members, leading to potential adjustments in both assessments and the assessment rubrics and guidelines. The panel has been assured that these procedures will guarantee high-quality assessments.

To ensure a manageable programme for students, assessments are evenly distributed throughout the academic year and across the proposed courses and projects. The panel observed that a proper balance between formative and summative assessments was sought in the design of the curriculum. The students interviewed by the panel expressed confidence in the support they received for their development and growth through feed-up and feed-forward moments, as well as formative assessments.

The CS&P programme concludes with a 30 EC graduation project that enables students to apply their knowledge, skills, and attitudes through a transdisciplinary research project in health or sustainability, working with a stakeholder commissioner. Students are responsible for all aspects of the project, including design, development, execution, planning, management, and interdisciplinary collaboration. The project features analytical and experimental components, modelling, and data elements, and aligns with one or more Sustainable Development Goals. The final grade for the stakeholder project is based on a weighted average of the research proposal (10%), experimental work (30%), final report (40%), and defence presentation (20%), all graded using standardised assessment forms.

After reviewing a brief outline of the graduation project and the assessment forms for student deliverables available at the time of the site visit, the panel was concerned that only group assessments might apply to the final stakeholder project, making it challenging to ensure that each student meets the programme's learning outcomes individually. The EB addressed this concern by clarifying that students would be required to submit a final report (thesis) and hold a defence presentation individually, although they may work in groups under a stakeholder commissioner. The panel advises that the graduation project, including the final

course template and assessment grids, should be thoroughly completed, and made accessible to the prospective student cohort prior to the commencement of the programme.

The prospective Examinations Board operates across the entire programme, ensuring the quality of assessments and safeguarding the exit qualifications. Comprising members from the involved UvA faculties who are active researchers in fields relevant to Complex Systems and Policy, the EB monitors compliance with the Teaching and Examination Regulations (TER), appoints examiners, addresses fraud and examination complaints, and oversees the issuance of MSc diplomas. The EB regularly consults with the programme director to address assessment quality issues and provides advice for improvement. The programme intends to install the CS&P Assessment Committee, which will focus on quality assurance by conducting periodic screenings for validity, reliability, and transparency in assessments throughout the CS&P curriculum and evaluating course assessments. This Committee will report to the EB and provide feedback to examiners as needed.

During the site visit, the panel confirmed that the EB has actively contributed to the development of the Complex Systems & Policy programme. Their expertise has been significant in areas such as interdisciplinary examinations, the evaluation cycle, and ensuring that the profile and curriculum are constructively aligned. The panel could assert that the communication with the EB and teaching and management teams is sustained in mutual understanding and cohesion.

The panel concludes that the programme has a transparent system of assessment in place. It features a variety of assessment forms and clearly illustrates the connection between the programme's intended learning outcomes and the learning outcomes for each course and projects. Assessment constitutes an integral part of the educational process and adds to another learning opportunity for the student. The staff has showed a strong aspiration to further develop an assessment culture with a greater focus on active student participation, formative assessment, constructive feedback, coaching and guidance. The Examinations Board plays a key role in ensuring assessment quality, and the panel was confident that the Board could establish reliable procedures, leading to consistent and efficient decision-making processes. Considering all of these, the panel concludes that the intended programme meets standard 3.

6.4 Degree

The panel advises awarding the following degree to the new programme: Master of Science.

6.5 Programme extension

The UvA academic master programme in Complex Systems and Policy has been proposed for the duration of two years (120 EC). The programme management's rationale is closely tied to the programme's breadth and complexity, which encompass interdisciplinary and transdisciplinary approaches to addressing policy challenges in the domains of health and

sustainability. This approach is endorsed by the professional field and aligns with international academic standards The panel has assessed the arguments, using the criteria put forward in the Protocol for programme extension of NVAO, published on 8 October 2003.

Findings, analysis and considerations

The panel is convinced that for MSc Complex Systems and Policy students to be truly competitive in the (inter)national market, they must master both complex systems and policy analysis. The professional field demands a robust education in complex systems coupled with a deep understanding of policy implications. The panel emphasises the necessity of a broad range of disciplines, cutting-edge technical knowledge, and transferable skills to work effectively in inter- and transdisciplinary environments, particularly in the domains of sustainability and health, which are increasingly critical in addressing global challenges. The panel strongly believes that the qualifications required for graduates to remain competitive in the international job market cannot be achieved within a one-year programme.

The panel considers the proposed design of the two-year master's curriculum to be well-primed to ensure the attainment of the CS&P exit qualifications. Additionally, the panel notes that the benchmark study conducted by the programme is relevant and thorough, concluding that nearly similar programmes in related disciplines (e.g., MSc Complex Systems and Engineering and Management at TU Delft) in the Netherlands also take two years (120 EC).

Conclusion

Given these strong arguments in favour of a two-year curriculum, the panel advises granting the University of Amsterdam the right to offer the new Complex Systems and Policy programme as a two-year academic master's programme with a study load of 120 EC.

Abbreviations

CBS	Centraal Bureau voor de Statistiek/ Central Bureau for Statistics
CEFR	Common European Framework of Reference for Languages
CS&P	Complex Systems and Policy
EB	Examinations Board
GGD	Gemeentelijke Gezondheidsdienst/ Public Health Service
IAS	Institute for Advanced Study
IIS	Institute for Interdisciplinary Studies
ILO	Intended Learning Outcomes
MSc	Master of Science
NVAO	Nederlands-Vlaamse Accreditatieorganisatie/ Accreditation Organisation of the Netherlands and Flanders
STQ	Senior Teaching Qualification
TER	Teaching and Examination Regulations
TNO	Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek/ Netherlands Organisation for Applied Scientific Research
TU Delft	Delft University of Technology
UMC	Universitair Medisch Centrum/University Medical Centre
UvA	University of Amsterdam
UTQ	University Teaching Qualification
WKR	Wetenschappelijke Klimaat Raad/ Dutch Scientific Climate Council

NVAO