



MSc Ecology
Vrije Universiteit Amsterdam

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Project code P2116

Inhoud

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Summary

Standard 1. Intended learning outcomes

The panel appreciates the profiles of the various specializations of the MSc Ecology. It considers the research-oriented specializations well-chosen as they reflect the combined research expertise of both VU Amsterdam and the University of Amsterdam. The international IMABEE programme benefits from the expertise of the researchers of the partner universities as well. The panel is also pleased with the societally-oriented M and C specializations. These specializations contribute to the programme's professional, more applied aspects. In this respect, the panel appreciates the newly-installed professional advisory board (PAB). Provided it has a highly diverse composition, the PAB can enrich the programme with its external perspectives. The panel suggests that the programme discuss with the PAB what, in the PAB's view, the programme's most unique selling points are and use this information to communicate its profile even more distinctly to the outside world. The intended learning outcomes (ILOs) for all specializations are in line with the programme's profile and are well-formulated and sufficiently concrete. Furthermore, the ILOs clearly demonstrate the programme's academic orientation. They tie in well with the Domain-Specific Framework of Reference and reflect the Dublin descriptors for the master's level. The panel suggests including an intended learning outcome regarding fieldwork and considering specific ILOs or a further concretization of ILOs for the M and C specializations.

Standard 2. Teaching-learning environment

The panel is pleased with the MSc Ecology curriculum. It adequately covers the ILOs (for all specializations under review) and is coherent, feasible and well-structured. The various specializations within the curriculum and the many options within each specialization offer students ample opportunities for personalization. The curriculum clearly reflects the research foci of the staff, creating strong ties between research and education. The strong academic orientation is reinforced by the two research projects/internships, the literature review, the focus on fieldwork and the excellent training in academic skills. However, the Ecology and Evolution (E&E) specialization would benefit from further attention to preparing students for the professional labour market outside academia. More direct experience with employment in applied settings and professional skills training would be advisable. In this context, the panel considers the Employability, Skills & Career course as valuable, yet not enough to meet the needs of all students. The panel is pleased with the didactic principle of constructive alignment and considers the teaching methods adequate and varied. The panel applauds the way academic citizenship is trained in the masterclasses. The diversity in the international classroom could be made even better use of to stimulate students' intercultural awareness and skills. Teaching staff have the proper qualifications to deliver the programme. The VU Amsterdam and UvA staff together cover a broad spectrum of expertise, which is further increased by the international networks related to the IMABEE partnerships. In the panel's view, this creates a very rich learning environment for students. Students of all specializations under review are adequately supported and guided. The students praise the small-scale atmosphere and the enthusiasm and approachability of their teachers. Supervisors could, however, be more active in helping students prevent project delays. The panel commends the staff for their dedication and flexibility during the pandemic. The teaching facilities are adequate and new lab facilities were being built at the time of the site visit. The panel would like to stress the importance of a proportionate number of lab facilities. The panel concludes that the embedding of the collaborations with the various partners (MSc MPA, UvA, IMABEE-partners) is sufficient.

Standard 3. Student assessment

The panel concludes that assessment in the MSc Ecology programme is in accordance with faculty and university regulations and the programme assessment plan. Assessment in the programme, in all specializations under review, adequately covers the learning objectives and the ILOs. The panel is satisfied

with the quality of assessment in the programme. The assessments are generally valid, reliable, transparent and up to standard. The panel is also satisfied with the assessment methods, which are varied and well-chosen.

The panel considers the assessment procedure of the final projects as adequately designed in all specializations under review. The panel is satisfied with the assessment and grading of the final projects of each specialization. Specifically for the E&E specialization, the panel concludes that the transparency of grading could be further improved. The E&E assessment form consists of various aspects of assessment (Report/Article, Attitude, Execution/Project Methodology, Presentation). On each aspect of the internship and research project (e.g., Report/Article) adequate and often extensive *overall* feedback is provided, which the panel highly appreciates. However, this (written) feedback is often missing at the level of the assessment criteria. The panel recommends the programme to see to it that, when using the rubrics, adequate substantiation for the assessment of each criterion is provided. Moreover, the panel advises the programme to increase the transparency of the grading process. In addition, the panel recommends using also a second assessor when assessing the oral presentation.

The panel concludes that adequate measures are in place to assure the quality of assessment and that the quality assurance procedures for the evaluation of assessments are appropriate. The Examination Board, supported by the assessment committee, does an excellent job in safeguarding the quality of assessment and the final attainment level. It was closely involved in adapting the assessment to distant education during the pandemic and the panel appreciates the advisory role it adopted to support staff during these trying times.

Finally, the panel concludes that the cooperation with UvA is based on mutual transparency and trust. The panel acknowledges the merits of the hands-on approach, which works well for both parties. The collaborations with the IMABEE consortium partners take place primarily on the basis of trust. Although the partners are all (part of) European Standards and Guidelines (ESG)-accredited programmes, given the examination board's legal responsibility, the panel thinks it is advisable to regularly check whether assessment policies at partner universities are still in line with VU policies and quality standards.

On the whole, the panel concludes that the programme has an adequate system of student assessment in place.

Standard 4. Achieved learning outcomes

The panel concludes that the final projects of the MSc Ecology programme demonstrate the realisation of the programme's ILOs. They are clearly of the level and quality that may be expected from an MSc thesis in the field of ecology and evolution. The theses of the C and M specializations also clearly reflect their own signature. The panel is pleased to see that the theses cover a wide variety of topics, include both field and lab projects and reflect the current research questions in ecology and evolutionary biology. The alumni look back on the programme with great satisfaction and feel the programme prepared them well for their careers. They find employment in relevant jobs in the Netherlands and abroad, both inside and outside academia.

Score table

The committee assesses the programmes as follows:

MSc Ecology

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
Ton Bisseling, chair	Mariëlle Klerks, secretary

Date: 8 February 2022

Introduction

Procedure

Assessment

On 2 and 3 November 2021, the Biology programmes of the Vrije Universiteit were assessed by an independent peer review committee as part of the cluster assessment Biology. The assessment cluster consisted of 21 programmes, offered by Utrecht University, Radboud University, the University of Groningen, Leiden University, the University of Amsterdam and Vrije Universiteit. The assessment followed the procedure and standards of the NVAO Assessment Framework for the Higher Education Accreditation System of the Netherlands (September 2018).

Quality assurance agency Academion coordinated the assessment upon request of the Biology cluster after taking over from Qanu per August 2021, when the first site visit to Utrecht University had already taken place. Els Schröder acted as coordinator for Qanu during the start-up phase and the site visit to Utrecht University. From then on, Fiona Schouten and Peter Hildering acted as coordinators and secretaries in the cluster assessment, and Mariëlle Klerks acted as secretary. They have all been certified and registered by the NVAO. For the Vrije Universiteit Amsterdam, Peter Hildering acted as coordinator and Mariëlle Klerks as secretary.

Preparation

Qanu composed the peer review committee in cooperation with the institutions and taking into account the expertise and independence of the members as well as consistency within the cluster. On 22 June 2021, the NVAO approved the composition of the committee. The coordinator instructed the committee chair on 7 April 2021 on his role in the site visit.

The contact persons for the Vrije Universiteit composed a site visit schedule in consultation with the Qanu and Academion coordinators (see appendix 3). They selected representative partners for the various interviews. It was determined that the development dialogue would take place after the site visit. A separate development report was made based on this dialogue.

The site visit was development oriented. Before the site visit, Academion received the relevant documentation from the programme, consisting of an extensive set of current documentation pertaining to the four standards of examination that served as self-evaluation report. This included a comprehensive analysis of the programme's strengths and weaknesses, and a separate and independent student chapter along with the required appendices. Before and during the site visit, the panel studied the additional documents provided by the programmes. An overview of these materials can be found in Appendix 4.

The programmes provided the coordinator with a list of graduates over the period 2017-2021. In consultation with the coordinator, the committee chair selected 16 theses for the programme. He took the diversity of final grades and examiners into account, as well as the various specializations. The selection included one thesis for each of the societal specializations, as well as three theses of the double degree programme IMABEE. Prior to the site visit, the programmes provided the committee with the theses and the accompanying assessment forms. They also provided the committee with the self-evaluation reports and additional materials (see appendix 4).

The committee members studied the information and sent their findings to the secretary. The secretary collected the committee's questions and remarks in a document and shared this with the committee members. In a preliminary meeting, the committee discussed the initial findings on the self-evaluation reports, additional documents and the theses, as well as the division of tasks during the site visit. The committee 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 committee interviewed various programme representatives (see appendix 3). The committee also offered students and staff members an opportunity for confidential discussion during a consultation hour. No consultation was requested. The committee used the final part of the site visit to discuss its findings in an internal meeting. Afterwards, the chair publicly presented the preliminary findings.

Report

The secretary wrote a draft report based on the committee's findings and submitted it for peer assessment within Academion. Subsequently, the secretary sent the report to the committee for feedback. After processing this feedback, the secretary sent the draft report to the Faculty of Science of the Vrije Universiteit Amsterdam in order to have it checked for factual irregularities. The secretary discussed the ensuing comments with the committee chair and changes were implemented accordingly. The committee then finalised the report, and the coordinator sent it to the Vrije Universiteit.

Committee

The following committee members were involved in the cluster assessment:

- Prof. dr. Ton Bisseling, professor emeritus Molecular Biology at Wageningen University & Research (chair);
- Em. prof. dr. Nico van Straalen, professor emeritus of Animal Ecology at Vrije Universiteit (vice-chair);
- Prof. dr. Aard Groen, professor of Entrepreneurship & Valorization at University of Groningen;
- Prof. dr. Menno Witter, Professor of Neuroscience at Norwegian University of Science and Technology;
- Prof. dr. Ellen Blaak, Professor of Human Biology at Maastricht University;
- Prof. dr. Roos Masereeuw, professor of Experimental Pharmacology at Utrecht University;
- Prof. dr. Sander Nieuwenhuis, professor Cognitive Psychology at Leiden University;
- Prof. dr. Maarten Frens, professor in Systems Physiology at Erasmus University Rotterdam;
- Prof. dr. ir. Jan Kammenga, professor of Functional Genetics at Wageningen University & Research
- Prof. dr. Dennis Claessen, professor Molecular Microbiology at Leiden University;
- Prof. dr. Isa Schön, team leader at the Royal Belgian Institute of Natural Sciences and guest professor at Hasselt University, Natural Sciences, Centre of Environmental Sciences;
- Prof. dr. Hauke Smidt, professor Microbial Ecology at Wageningen University & Research;
- Prof. dr. ir. Wim Petegem, professor in Engineering Education at the unit Engineering Technology Education Research (ETHER) of KU Leuven;
- Dr. Frank van der Wilk, executive director Netherlands Commission on Genetic Modification;
- Dr. Mariken de Krom, head team Education and Research (Brain Division) at UMC Utrecht;
- Dr. Mieke Latijnhouwers, assessment expert at Education Support Office of Wageningen University & Research;
- Ir. Eric Schouwenberg, head of department Nature and Biodiversity at Arcadis;
- Dr. Peter Korsten, researcher and lecturer in Behavioural Ecology at Bielefeld University;
- Dr. Éva Kalmár, researcher and lecturer in Science Communication at Delft University of Technology;

- Dr. Mark Bos, researcher and lecturer in Science Communication at Utrecht University;
- Drs. Bas Reichert, founder and CEO of BaseClear (microbial genomics);
- Jelle Keijzer BSc, master student Molecular Cellular Life Sciences at Utrecht University (student member);
- Ishara Merhai, bachelor student Biology at University of Amsterdam (student member).

The committee assessing the Biology programmes at the Vrije Universiteit Amsterdam consisted of the following members:

- Prof. dr. Ton Bisseling, emeritus professor Molecular Biology at Wageningen University & Research (chair);
- Prof. dr. Isa Schön, team leader at the Royal Belgian Institute of Natural Sciences and guest professor at Hasselt University, Natural Sciences, Centre of Environmental Sciences;
- Prof. dr. ir. Wim Petegem, professor in Engineering Education at the unit Engineering Technology Education Research (ETHER) of KU Leuven;
- Ir. Eric Schouwenberg, head of department Nature and Biodiversity at Arcadis;
- Dr. Peter Korsten, researcher and lecturer in Behavioural Ecology at Bielefeld University;
- Dr. Mark Bos, researcher and lecturer in Science Communication at Utrecht University;
- Jelle Keijzer BSc, master student Molecular Cellular Life Sciences at Utrecht University (student member);

Information on the programme

Name of the institution:	Vrije Universiteit
Status of the institution:	Publicly funded institution
Result institutional quality assurance assessment:	Positive
Programme name:	Ecology
CROHO number:	60607
Level:	Master
Orientation:	Academic
Number of credits:	120 EC
Specializations or tracks:	- Research specialization Master Ecology & Evolution - International Master Biodiversity, Ecology & Evolution (IMABEE) - Science Communication (SC) - Science in Society (SiS) - Science Education
Location:	Amsterdam
Joint programme:	International Master Biodiversity, Ecology & Evolution (IMABEE) – double degree with University of Rennes, University of Göttingen and University of Aarhus
Specialization Education (cluster ULO 2020-2021)	applicable
Mode(s) of study:	Full-time
Language of instruction:	English
Submission date NVAO:	1 May 2022

Description of the assessment

MSc Ecology: cooperation between the Vrije Universiteit Amsterdam and the University of Amsterdam

The MSc Ecology is a cooperation between the Vrije Universiteit Amsterdam (VU Amsterdam) and the Ecology and Evolution track of the MSc Biological Sciences programme at the University of Amsterdam (UvA; accredited in 2021 within the same assessment group). The specifics of this collaboration are laid down in a collaboration agreement (which the panel studied a draft version at the time of the site visit). The programme has an integrated curriculum that is jointly coordinated and offered by the Faculty of Science at VU Amsterdam and the Faculty of Science at UvA. This means that courses and teaching staff are combined. Furthermore, the handbooks of education-related Rules and Regulations (R&R) and Teaching and Examination Regulations (TERs) were aligned.¹ Although the programme is jointly offered, it does not lead to a double or joint degree. Students are awarded a degree from the university at which they are enrolled. Moreover, each university remains fully responsible for its programme and its quality assurance.

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

The MSc Ecology programme at VU Amsterdam is a two-year master's programme offered in English. It aims to provide students with the knowledge, skills and insights required to operate as independent professionals in the field of ecology and evolution and to become qualified candidates for a subsequent PhD position or other research-, education- or advice-related function in a fundamental or applied ecological or evolutionary institute or company in the Netherlands or elsewhere. The programme intends to equip its students with eco-evolutionary knowledge and skills so that they can contribute to providing solutions to environmental problems. The programme contains two research specializations and three societally-oriented specializations.

Research-oriented specializations

1. The E&E research specialization teaches the ecological and evolutionary relationships between living organisms, the extinction, adaptation and evolution of species and the functioning of organisms and ecosystems at all levels of organization (from gene to ecosystem).
2. The International Master Biodiversity, Ecology and Evolution (IMABEE) is offered together with three partner universities, Aarhus Universitet (Denmark), Georg-August Universität Göttingen (Germany) and the Université de Rennes 1 (France). The aims of the IMABEE programme are equivalent to those of the E&E specialization. However, students in the IMABEE programme spend their first academic year at their home university and continue their second-year studies at one of the partner universities. Completion of the programme results in a double degree: an MSc in Ecology and Evolution from their home university and from the chosen partner university. The IMABEE programme began in 2016 and the current terms and conditions of the collaboration are described in the document titled Cooperation agreement for implementation of the International Master in Biodiversity, Ecology, and Evolution (September 2021- August 2026), of which the panel received a copy.

¹ In fact, the coordination between VU Amsterdam and UvA on the handbooks of education-related Rules and Regulations (R&R) and Teaching and Examination Regulations (TERs) took place at university-wide level during the discussions about a possible merger of the two universities. The merger, however, never came to fruition.

Societally-oriented specializations

In order to develop a more societally-oriented profile, students can choose between three societally-oriented specializations. Students begin their studies in the E&E research specialization before transitioning to one of the following dedicated specializations in their second year:

3. The Science in Society specialization (M) is a transdisciplinary specialization that provides tools and strategies for understanding and approaching complex societal problems related to scientific and technological development. It prepares students for working as consultants, policy-makers, (academic) researchers or entrepreneurs at the interface of science, technology and society. The M specialization is housed at the Athena Institute, a research and education department within the Faculty of Science.
4. The Science Communication specialization (C) provides students with the relevant knowledge, skills and practical experience to help shape meaningful conversations about science in public. It prepares students for a career, for instance, as a science journalist, communication advisor or content manager at a science museum. Like the M-specialization, the C specialization is housed at the Athena Institute.
5. The Science Education specialization (E) is organized by the University Centre for Behaviour and Exercise (UCGB) of the Faculty of Behavioural and Movement Sciences (FGB). The E specialization is taught in Dutch and prepares students to become secondary school teachers in biology. The E specialization is not covered in the remainder of this assessment, as it was included in the accreditation of the MSc Leraar VHO in de Bètawetenschappen (accredited in 2021).

The panel appreciates the profiles of the various master's specializations. It considers the research-oriented specializations well-chosen because they reflect the combined research expertise of both VU Amsterdam and UvA. The IMABEE specialization, moreover, benefits from the expertise of the researchers of the partner universities as well. The panel is also pleased with the societally-oriented M and C specializations. These specializations contribute to the programme's professional, more applied aspects, which the panel considers important in view of the fact that a substantial number of alumni pursue professions outside academia. In this respect, the panel was also pleased to learn that the programme has recently assembled a professional advisory board (PAB), which will provide the programme with solicited and unsolicited advice on matters related to the connection of the programme to the (non-academic) professional field. In this context, the panel is of the opinion that the PAB would be the most beneficial when it represents the full spectrum of the relevant professional field and when it is composed of both VU Amsterdam alumni and alumni from other (international) universities, thus ensuring a variety of external perspectives. The panel suggests that the programme discuss with the PAB what the PAB views the programme's most unique selling points to be and use this information to communicate the programme's profile even more distinctly to the outside world.

The programme's intended learning outcomes (ILOs) are aligned with its profile, well-formulated and sufficiently concrete. They are formulated along the lines of the Dublin descriptors, thus clearly reflecting the master's level. The ILOs adequately demonstrate the programme's research orientation as well as its attention to the application of scientific knowledge to societal problems. Moreover, they tie in well with the Domain-Specific Framework of Reference (26 June 2020). The panel noted that an ILO for fieldwork is currently missing. However, the panel thinks highly of the amount of fieldwork carried out during the programme and feels that the programme sells itself short by not including this in its ILOs. The panel, therefore, suggests the inclusion of an ILO regarding fieldwork. Furthermore, the panel suggests considering specific ILOs or a further concretization of ILOs for the M and C specializations. Although the current ILOs sufficiently cover these specializations as well, the ILOs could be made more explicit in terms of the knowledge and skills offered by the C and M specializations.

Considerations

The panel appreciates the profiles of the various specializations of the MSc Ecology. It considers the research-oriented specializations well-chosen as they reflect the combined research expertise of both VU Amsterdam and UvA. Additionally, IMABEE benefits from the expertise of the researchers of the partner universities. The panel is also pleased with the societally-oriented M and C specializations. These specializations contribute to the programme's professional, more applied aspects. In this respect, the panel appreciates the newly-installed PAB. Provided it has a highly diverse composition, the PAB can enrich the programme with its external perspectives on the programme. The panel suggests that the programme and the PAB discuss the programme's most unique selling points and use these to better communicate its profile even more distinctly to the outside world. The ILOs for all specializations are in line with the programme's profile and are well-formulated and sufficiently concrete. The ILOs also clearly demonstrate the programme's academic orientation and tie in well with the Domain-Specific Framework of Reference. They also reflect the Dublin descriptors for the master's level. The panel suggests including an ILO regarding fieldwork and considering specific ILOs or a further concretisation of ILOs for the M and C -specializations.

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 curricula of all five specializations of the two-year MSc Ecology programme are similar in the first year. The first year includes compulsory courses (18 EC), constrained elective ecological courses (12 EC) and the first research project/internship (30 EC minimum). The compulsory courses include the introductory course Current Trends in Ecology & Evolution (6 EC), a course on Ecological Data Analysis (6 EC) and masterclasses (3 EC) that offer students a broad overview of the latest research in ecology and evolution. In addition, there is a mandatory course titled Scientific Writing in English (3 EC). A further mandatory course is Employability, Skills & Career (0 EC), which aims to create awareness about the need for proper labour market orientation. Students are asked to reflect upon their strengths and weaknesses and to develop and improve their skills. The first research project/internship focusses on a subject related to ecology and evolution and takes place either at the Department of Ecological Science at VU Amsterdam or at the Institute for Biodiversity and Ecosystem Dynamics at UvA. The research project or internship is carried out under the supervision of a VU Amsterdam or UvA lecturer. An overview of the curricula for each specialization can be found in Appendix 2.

After the first year, the curricula of the five specializations differ. The vast majority of students choose the E&E specialization. In the second year of their studies, students following the E&E track proceed with a second research project/internship (a minimum of 30 EC), a written (applied) literature review (12 EC), further masterclasses (adding to 3 EC over the two years) and additional elective courses. For the E&E students, the curriculum offers some flexibility as to how much time they will spend on the research projects or elective courses. Over the two years, E&E students must take at least 12 EC of elective courses. Students may not exceed 18 EC of elective courses. If they choose to take 12 EC in elective courses, the credits for both research projects/internships must be a total of 78 EC. If students opt for 18 EC in elective courses, they are

required to spend 72 EC in total on their research projects or internships. Furthermore, the shortest project should be at least 30 EC. Like the first research project/internship, the second research project/internship focusses on an ecological or evolutionary subject. Students, however, are encouraged to complete the second internship at another university or research institute in Amsterdam, the Netherlands or abroad. In line with the previous accreditation panel's advice to offer students more societally-oriented professional experience, the second research project/internship can be societally-oriented and conducted at a research institute other than a university, provided that the institute is of sufficient academic calibre, the student has developed an adequate research question, and proper supervision is available (cf. Student Guidance). For the Literature Review students must write a literature review that investigates an ecological or evolutionary question. Students may opt to take a more applied approach to the literature review. This allows students to apply their research skills to a problem of practical or societal significance.

A minority of the students chose the IMABEE -specialization. Students who completed their first year in Amsterdam can spend their second year at one of the partner universities. They take a maximum of 30 EC of advanced courses chosen from the Master's degree programme in Biology (Aarhus), the International Master in Biodiversity, Ecology and Evolution (Göttingen) or the Master in Functional, Behavioural and Evolutionary Ecology (Rennes). At least 30 EC in the second year are dedicated to the internship/Master's Research Thesis, which is conducted at an academic research institution or in a research-oriented industry. For incoming students from the partner universities, the Current Trends in Ecology & Evolution course (6 EC) and a research project (at least 30 EC) are mandatory. These students fill the rest of their second year with (constrained ecological) electives or an extension of the research project.

Another minority of students opt for the C, M or E specialization. C and M students follow the cursory programme of the first year of the two-year master's programme Management Policy Analysis and Entrepreneurship in the Health and Life Sciences (MSc MPA, accredited in 2019). Students of both specializations take the mandatory course titled Research Methods for Analysing Complex Problems (6 EC) and complete a research internship (30 EC). In addition, students of the C specialization take the Communication specialization courses for the MSc MPA, such as Science and Communication, Science Museology, and Science Journalism. Students in the M specialization take courses oriented towards policy management and entrepreneurship, such as Communication, Organisation and Management, Policy, Politics and Participation, and Business Management.

The panel studied the curricula of the various specializations offered within the programme and concludes that the ILOs are adequately covered. The basic design of the curriculum is clear, well-structured and coherent. The first year provides an excellent basis in the field of ecology and evolution. In the second year, students can choose to either further specialise in this field (by choosing one of the two research specializations) or broaden their knowledge and skills towards more applied fields (by choosing one of the societally-oriented specializations). Through the various collaborations, students have access to a large network of researchers in the field. In the panel's view, this creates a very rich learning environment. In addition, with the freedom to choose from various specializations and the many options within each specialization, students have ample opportunity to pursue their own preferences. They can set their goals and design an almost tailor-made programme to work towards achieving their goals. This freedom is very much appreciated by the students and the alumni, as the panel learned during the site visit. The panel is of the opinion that this is, indeed, a particularly strong point of the programme, since students can develop their own unique profile, thus distinguishing themselves from others. This may be crucial when applying for jobs or PhD positions.

The panel noted with appreciation that the curriculum clearly reflects the research foci of the researchers involved. This creates strong ties between research and education, allowing students to be introduced to and involved in ongoing research. This is especially valuable for students in the research specializations who wish to prepare themselves for an academic career. The strong academic orientation of the programme is furthermore emphasised by the large research component constituted by the literature review, the two research projects/internships (which students can even extend) and the focus on fieldwork. Furthermore, the academic focus is also well-embedded in the coursework. For example, in the first- and second-year masterclasses, students are trained to critically evaluate scientific research articles and practice scientific argumentation and discussion. The masterclasses provide excellent training in academic skills. Another example discussed during the site visit is the first-year constrained elective course titled Ecosystem Services and Scientific Advocacy, which teaches students to develop critical ways to evaluate and interpret scientific information and shows them how to analyse a large body of information. Alumni felt that scientific advocacy taught them to talk about science in a broader way and that this turned out to be very useful later on in their careers. One thing that the students felt would be a valuable addition to the programme is training on how to write a research proposal (e.g., for NWO or PhD positions). The panel learned, however, that this is already incorporated in the introductory Current Trends in Ecology and Evolution course. Although the panel considers it as positive that attention is already being paid to this aspect, it thinks that it would be even more beneficial addressing this kind of training later on in the programme, when students have more research experience.

With the programme's strong academic orientation, students are well-prepared for a career in academia. Preparation for the professional labour market, however, could benefit from further attention in the panel's view (this does not apply to the C, M and E specializations). The panel notes with satisfaction that the programme pays attention to aspects of employability within the Employability, Skills & Career course. Students learn, for instance, how to identify their strengths and weaknesses and match these to job possibilities, how to complete a job application and how to write a resume. In this course, they are also offered the opportunity to network with alumni. Since the last accreditation, the programme has already made progress towards offering students opportunities to gain experience in non-academic professional settings (e.g., through the applied literature review and the societally-oriented second research project). However, direct experience with what work will look like in relevant professional, more applied settings (consultancy, policy making, etc.) and professional skills training (e.g., interdisciplinary teamwork, experience coping with different perspectives on a topic, professional communication skills, etc.) still remain somewhat limited. This is also what the students and the alumni have noted as one of the main points of improvement for the programme. More attention to societally-oriented and applied aspects and settings, especially in the first year, could help students to make a more informed decision about which specialization to choose in their second year (research specialization or one of the three societally-oriented specializations). Therefore, the panel advises the programme to investigate the possibilities for embedding or incorporating more societally-oriented components and professional skills training into compulsory components of the curriculum, especially in the first year. In this context, the programme may think along the lines of a team project on a societal problem with a multi- or interdisciplinary approach. The programme may consider collaboration on this topic with the C and M specialisations. Furthermore, the panel believes that the newly-created PAB could be useful in this respect. The PAB members could discuss with the programme the type of experiences and skills that would be useful to students in the programme. In the future, the PAB may even be able to teach these skills or offer opportunities for gaining professional experience.

The panel is also satisfied with the curricula of the IMABEE -specialization and the C and M specializations. Within the IMABEE specialization, students are offered a wide range of additional opportunities for a personalised study trajectory through the complementary expertise of the partner institutions. Furthermore,

the IMABEE specialization offers students the valuable possibility of enhancing their network and gaining international experience. The panel wonders why only a small number of VU students choose this specialization. During the site visit, students told the panel that, although the double degree is attractive, the E&E specialization also offers possibilities for going abroad, for instance, during the internship. Those options have the advantage that they are not limited to the IMABEE partnerships and that they will not take an entire year. Moreover, half of the students in the MSc Ecology programme are international students and do not feel the need to study in another country.

The panel notes that within the C and M specializations, students are offered ample opportunities to create their own study path and gain the additional knowledge and skills that enable them to use their knowledge of ecology and evolution in science communication, business or policy. Furthermore, the panel is of the opinion that with the maximization of the specialization at 60 EC, which includes the mandatory 30 EC for the first research project/internship that is part of the first year of the E&E programme, students acquire sufficient research- and domain-specific knowledge and skills. Moreover, during the site visit, students informed the panel that assignments in their specialization courses are targeted towards the field of ecology and evolution. This, in the panel's view, ensures sufficient connection between the first year of the programme and the year spent working towards a specialization.

Teaching methods and the impact of COVID-19

The programme design is based on the didactic principle of *constructive alignment*. For the teaching-learning process, this means that, based on the learning objectives of the course, the theoretical explanation of topics is accompanied as much as possible with associated practical activities. The programme uses adequate and sufficiently varied teaching methods. These include interactive teaching in small groups, practicals, lectures, seminars, presentations, excursions, fieldwork and supervised internships. Furthermore, students learn from each other through peer feedback. The panel commends the programme for the way the masterclasses are taught. Each masterclass session is taught by a different guest speaker (scientist). Beforehand, students study several recent papers by the guest speaker and discuss them during a tutorial meeting with their lecturers and fellow students. Students then participate actively in a discussion with the speaker. The discussion mimics real-life academic practice and the panel deems this an excellent way to teach academic skills and develop academic citizenship.

The panel learned from the self-evaluation report that the programme views a diverse, international cohort of students as an added educational value. The panel fully agrees with the programme on this topic. During the site visit, the panel discussed internationalization in the programme with the students and learned that the students felt that no explicit attention has been given to intercultural awareness or intercultural skills. Based on this discussion, the panel suggests that the programme make better use of the opportunities offered by the international composition of the student body. Using diversity as a resource for teaching by drawing on students' diverse cultural backgrounds and perspectives could stimulate students' intercultural awareness and build intercultural skills.

The COVID-19 pandemic impacted the courses and the teaching methods. During the lockdowns, all offline lectures on campus were replaced by online Zoom sessions. Thus, video content, webinars and other online materials were frequently used. Small discussion groups could be facilitated by Zoom and practical work could continue in smaller groups that respected the group size restrictions imposed by the Dutch government. It was more difficult, however, to find alternatives for fieldwork given the group size restrictions. This resulted in the cancellation of excursions and fieldwork. The programme has tried to resolve this by having small groups of students conduct experiments in their own local environment. The programme has also reduced the number of projects with a fieldwork component, instead offering projects

involving computer modelling or based on data from scholarship. Furthermore, the programme allowed students to complete their literature review before their first research project/internship instead of afterwards in order to help students to avoid excessive delays. Nonetheless, some study delays (e.g., because of discontinuation of internships) unfortunately could not be avoided. During the site visit, students were very appreciative of the efforts made by the programme to deliver the curriculum as well as possible during the lockdowns and they were pleased by the flexibility demonstrated by the programme during these trying times. The panel commends the programme for going to great lengths to keep the negative impact of the pandemic as small as possible.

Student guidance and feasibility

Admission to the programme takes place according to the admission requirements laid down in the Teaching and Examination Regulations: Master's programme in Ecology, 2021-2022 (TER). Incoming students are selected based on prior education (a high level of relevant knowledge and skills and a strong command of research methods from the relevant field), motivation, English language proficiency and prior grades. Admission to the IMABEE specialization is only granted to students who have completed all first semester courses of year 1 with above-average grades. Students from other backgrounds who wish to enter the MSc Ecology programme must first complete a pre-master's programme. On entering the programme, students take the introductory course on Current Trends in Ecology & Evolution. This course is mandatory for all students and helps bring students with a variety of backgrounds onto the same page. Moreover, the course is important from a social perspective, as it facilitates cohort formation. The panel is pleased with the admission procedures and onboarding process because they ensure that all incoming students are well-equipped to complete the programme.

Students of all specializations are adequately supported by teaching staff, internship coordinators and supervisors, study advisors and mentors. As discussed above, the programme offers students ample opportunities to personalise their curriculum. The first-year course, Employability, Skills & Career, helps students choose the best career path. The supervisors also aid the students in this decision-making process. During the site visit, the panel learned from the students that information provision on the many options is clear and the freedom of choice does not pose any problems. Students are very pleased with the small-scale atmosphere of VU Amsterdam and the approachability of their lecturers, which make them feel comfortable enough to ask questions.

The procedures for the second internship/research project are clearly described in the respective placement manuals for the various specializations. The manuals state that the placement, major or specialization coordinator ensures that placements are of the appropriate level and scope and evaluates the quality of daily on-site supervision. The placement coordinator may also support students in their search for an internship. The VU supervisor has the final responsibility for the supervision of the student during the entire project. The VU supervisor advises the student during decisive moments such as changes in research plan, problems with supervision or analysis issues. At the start of the placement, the VU supervisor discusses the research question, the methodology and the expected outcome of the research proposal with the student and on-site supervisor, if applicable. After the start of the internship, the VU supervisor provides an interim evaluation, and at the end of the internship, the VU supervisor comments on draft versions of the report. Furthermore, in all placements outside VU Amsterdam, there is an on-site supervisor, who is a staff member at the institute offering the placement. This on-site supervisor should have relevant knowledge of the placement subject and preferably holds a PhD and a position in higher education or research. In the IMABEE specialization, student supervisors are from the hosting university. Students feel that they are adequately supported and are satisfied with the supervision they receive.

Students consider the programme challenging yet feasible. Nonetheless, the panel notes that the programme takes more than two years to complete for a relatively high number of students. During the site visit, the students told the panel that this is largely due to research project experiments that take more time than expected. The panel agrees with the students that supervisors could be more proactive in ensuring that students complete their experiments within the timeframe required to complete their projects on time. Furthermore, the planning and scheduling of the first-year coursework were discussed, especially in light of increasing student numbers. Currently, courses are offered over a four-week six-week period (plus exam preparations). Students told the panel that they would prefer this to be changed into a more intensified two or three weeks of one course at a time. The advantage for students would be that they do not have to divide their attention between their courses, instead focussing completely on one course. For lecturers, this could contribute to a more manageable workload. The panel thinks that the students have a point but also wishes to point out the danger that the acquired knowledge might fade more easily, as has been the case at other universities.

Students feel that the courses are well-organised. Generally, information provision is adequate. In some cases, however, students encountered some small administrative problems related to the VU Amsterdam-UvA collaboration. The Programme Committee (PC), however, plays an active role and sees to it that any problem regarding the quality of courses and internships receives proper attention. In this context, the panel notes that the VU PC has regular contact with the UvA PC. Student evaluations for all courses are shared between the PCs, and the PCs meet twice a year to discuss the course evaluations and the curriculum. Quality assurance of the C and M specializations is mandated to the PC of the MSc MPA, the programme that organizes the education for these specializations. For the IMABEE specialization, the Cooperation Agreement of the consortium indicates that each of the partners is responsible for the quality assurance of its own courses.

Language of instruction

The programme is taught in English, which, in the panel's view, is an adequate choice given the international orientation of the research field and the global labour market. The programme is offered by a team of scientists from many nationalities, which makes the English language the best choice. Staff members either hold an English Teaching Certificate (73%), are in the process of obtaining the certificate (13%) or are native speakers. Students are satisfied with the fact that the programme is taught in English. Students who come from the biology bachelor's degree programme at VU Amsterdam feel adequately equipped for completing an English-language programme. Foreign students entering the programme must meet the English language proficiency requirements as part of the admission requirements. Moreover, students are adequately supported in further developing their English skills in the Scientific Writing in English course.

Teaching staff and facilities

Teaching staff consists of the combined staff from the Faculty of Science at VU Amsterdam and the Faculty of Science at UvA. Each university is responsible for the quality of its own staff, but the quality of teaching staff is comparable and is assured in the context of their respective accreditations. The collaboration goes smoothly, and students hardly even realize whether a lecturer is from VU Amsterdam or UvA.

The panel finds that the teaching staff have the adequate qualifications to deliver the programme. The VU Amsterdam and UvA teaching staff together cover a broad spectrum of expertise. Staff members are usually actively involved in research and are also didactically skilled. All staff members have the required basic teaching qualification and two of them hold a senior teaching qualification.

To further professionalise teaching staff, VU Amsterdam has a well-functioning system in place: the LEARN! Academy and the VU Amsterdam Education Lab. During the pandemic, these offices were very supportive when staff had to develop alternative teaching and assessment methods. Staff told the panel that now that they know what assistance is available from these offices, they are even more motivated to redesign courses and make them more innovative. Although staff experienced an increased workload due to COVID-19, the workload was feasible, characterised by peaks and drops. Students commended their teachers on their enthusiasm and dedication, especially also during the COVID-19 pandemic.

In the IMABEE, C and M specializations, the staff come from either the respective programmes of the partner universities or the VU MSc MPA programme. Requirements for the staff at the partner universities are the general requirements expected in the field and comparable to the VU Amsterdam requirements. Moreover, the quality of the staff of the partner universities is subject to the ESG-based quality assurance systems in the respective European countries. As for the M and C specializations, the quality of staff has been endorsed within the context of the accreditation procedure of the MSc MPA programme.

The panel considers the teaching facilities (labs, classrooms, etc.) to be adequate. The lab facilities were somewhat dated, but new facilities were being built at the time of the site visit. The panel would like to stress the importance of a proportionate number of lab facilities with regard to amount of students within the Faculty.

Considerations

The panel is pleased with the curriculum of the MSc Ecology programme. It adequately covers the ILOs (for all specializations under review) and is coherent, feasible and well-structured. The various specializations within the curriculum and the many options within each specialization offer students ample opportunities for personalisation. The curriculum clearly reflects the research foci of the faculty, creating strong ties between research and education. The strong academic orientation is reinforced by the two research projects/internships, the literature review, the focus on fieldwork and the excellent training in academic skills. In the E&E specialization in particular, preparation for the professional labour market outside academia would benefit from further attention. More direct experience with work in applied settings and professional skills training would be advisable. In this context, the panel considers the Employability, Skills & Career course as valuable, yet insufficient. The panel is pleased with the didactic principle of constructive alignment and considers the teaching methods adequate and varied. The panel applauds the way academic citizenship is trained in the masterclasses. The diversity in the international classroom could be better exploited to increase students' intercultural awareness and skills. The teaching staff have the proper qualifications to deliver the programme. The VU and UvA staff cover a broad spectrum of expertise, which is further increased by the international networks related to the IMABEE partnerships. In the panel's view, this creates a very rich learning environment for students. Students of all the specializations under review are adequately supported and guided, and students praised the small-scale atmosphere and the enthusiasm and approachability of their teachers. Supervisors could, however, be more proactive in helping students conduct their experiments in a timely manner. The panel commends the staff for their dedication and flexibility during the pandemic. The teaching facilities are adequate and new lab facilities were being built at the time of the site visit. The panel would like to stress the importance of a proportionate number of lab facilities with regard to the number of students at the Faculty. The panel concludes that the embedded collaborations with the various partners (MSc MPA, UvA, IMABEE-partners) are sufficient.

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

Student assessment in the MSc Ecology programme, including in the C and M specializations, takes place in accordance with faculty and university policies and regulations. Assessment is considered to be an integral part of the teaching and learning process and must be aligned with the learning objectives of a course or study component and the ILOs of the programme (*constructive alignment*). Furthermore, assessment is considered to be the responsibility of the examiner, and assessment rules and regulations must be clearly described. The outlines of the study programme and the assessment procedures are described in the TER. The programme assessment plan for the MSc in Ecology contains a schematic overview of all assessment components of the study programme in relation to the Dublin descriptors. The matrix shows the relationship between the ILOs of the programme and the learning objectives of the courses, as well as the teaching and assessment method(s) of the individual courses (formative/summative) and the weighting of partial tests and compensation arrangements (if applicable).

The panel has studied the TER and the overviews of the programme assessment plan, the information on assessment in the course descriptions in the study guide and a selection of assessments and the corresponding grading forms. Based on this information, the panel concludes that assessment in all the specializations under review adequately covers the learning objectives and ILOs. Assessment is generally valid, reliable, transparent and up to standard. In the Student Chapter, students state that they are generally satisfied with the assessments and that grading is fair and transparent. Sometimes, they would like to receive more feedback, but this varies and is often dependent on the lecturer. During the pandemic, adjustments were sometimes made to the formats of assessments or to the order of the exams. Students appreciate the flexibility demonstrated by the programme.

The panel is also satisfied with the assessment methods, which are varied and well-chosen (e.g., written exams, review papers, essays, literature surveys, poster presentations and oral presentations). Students are critical of the assessment form and grading used in the masterclasses. During the site visit, the panel learned from the students and the lecturers that grading is primarily based on the number and quality of questions students ask during the discussions with the guest speakers. This makes it difficult for students when another student asks a question they wanted to ask, causing some students to miss out on the opportunity to ask questions. Moreover, lecturers need to assess 24 students during a one-hour session, which the panel also considers questionable. At the time of the site visit, the PC was already informed. The panel advises the programme to investigate how the issues regarding the assessment of the masterclasses can be addressed without negatively impacting the excellent design of the masterclasses. Overall, the panel is satisfied with the quality of assessment in the programme.

Final projects

For the E&E specialization, the second internship/research project constitutes the final project. A project carried out by a VU Amsterdam student at UvA is formally considered to be an external research project, requiring a VU Amsterdam supervisor and second VU Amsterdam assessor in addition to the on-site UvA supervisor. Students can also choose to do a project outside VU Amsterdam, at another (Dutch or foreign) university or research institute (e.g., NIOO, IMARES, ALTEERRA) at organisations for nature conservation (e.g., Natuurmonumenten) or with regional authorities (e.g., Provincie and Waterschap). First, students submit an initial project proposal. Upon its approval by the placement coordinator, they begin their research

placement. After two weeks, they submit a detailed research proposal. After another six weeks, a go/no-go interim assessment takes place. When the students receive a 'go' from the VU supervisor, they complete their internships. Students are assessed by their VU supervisor on four different elements: 1) the final report (50% of the final grade), 2) an oral presentation (10%), 3) the execution of the research (40%) and 4) their attitude. For projects outside VU Amsterdam, the on-site supervisor advises the VU supervisor on the assessment of the placement, especially regarding the attitude and execution. At the time of the site visit, only the final report was independently assessed by a second assessor. The panel is of the opinion that it would be beneficial to assess the oral presentation by a second assessor. The final grade would be the average of the grades awarded by the VU assessor and the second assessor. In case of a difference of more than two points, or in case of one insufficient grade, a third assessor would be appointed by the examination board. The grades of the three assessors would then be averaged to arrive at the final grade. In the case of an insufficient grade, the grade awarded by the third assessor would be decisive. The report, presentation and execution of the research are graded on a scale from 1-10, while attitude is graded as pass/fail. Students need a 6 or a pass on all four elements in order to finalize the internship/research project.

Students in the C specialization also complete an internship/research project. Science communication research is integrated with the subject disciplinary research of the MSc Ecology programme. While gaining practical experience in the field of science communication, students simultaneously conduct a relevant research project during their internship at an organization. These organizations may be active in the field of journalism (e.g., science divisions of newspapers, magazines, and broadcasting organizations), content development (e.g., science centres, museums), or consultancy (e.g., strategy development and implementation, training and coaching). They might also be independent institutions at interface of science and society or NGOs focused on science and technology. Students in the M specialization complete their internship/research project at organizations such as universities or academic institutions, NGOs, governmental organizations, members of the pharmaceutical or biotechnology industry or consultancy companies. Students can conduct a management analysis, write a policy report, create a business plan (to be attached to an analytical report), evaluate a process or programme, conduct a feasibility study or assess a tool or method. The integration of the subject disciplinary component is aligned with the MSc Ecology programme. The internship process and procedures, the elements on which students are assessed, and the people involved in the assessment procedure are comparable to the E&E internship/research project. For the IMABEE specialization, students complete a research project at an academic research institution or in a research-oriented industry. The research project is expected to lead to an original contribution that is documented in a research report. This report should be in the form of a journal article that could be submitted for publication and could serve as the starting point for a PhD project. The thesis work is assessed by two academic examiners, one from the hosting university and one from the home university. This ensures that the requirements for both degree programmes are adequately covered. In the case of a thesis undertaken at an external organization, independent examiners are also involved.

The panel finds that the internship/research project assessment procedure is well-designed in all four MSc Ecology specializations under review. The panel has studied a representative selection of final projects and is satisfied with the assessment and grading of the final projects in each specialization. Specifically for the E&E specialization, the panel notes that the assessment form consists of various aspects of assessment (Report/Article, Attitude, Execution/Project Methodology, Presentation). The panel concludes that on each aspect of the internship/research project (e.g., Report/Article) adequate and often extensive *overall* feedback is provided. How the final grading of the various aspects is determined, however, is not fully transparent to the panel. It is not clear how the designations of *unsatisfactory*, *satisfactory*, *good* or *excellent* are awarded to the various assessment criteria because the substantiation is missing. At the same time, it is not clear to the panel how this grading system is translated into the grade awarded to the specific assessment aspect (e.g.,

Report/Article). The weight of each criterion in this grade is unclear. To improve the transparency of the assessment, the panel recommends that the programme ensure that, when using the rubrics, an adequate substantiation for the assessment of each criterion is provided. This will build a bridge between the *generic* rubrics and the *concrete* student work. Moreover, the panel advises the programme to increase the transparency of the grading process.

Quality assurance and examination board

Adequate measures are in place to assure the quality of assessment:

1. The application of the 'four-eyes principle' in test construction and the grading of assessments other than exams, such as reports, essays and presentations;
2. The appointment of examiners by the Examination Board based on specific criteria;
3. The calibration of assessments;
4. The management and storage of assessment files. These assessment files contain the exams (final, partial and practice exams) and the model answers, the assessment criteria/rubrics for assignments, the assessment matrix, the grade overview (including partial grades/assessments, final grades and pass rate), the course evaluation (including a reflection from the course coordinator on behalf of the lecturer team of the course);
5. The assurance that the assessment of final projects aligns with VU standards, meaning that a VU assessor is involved in the assessment of internships and research projects carried out at UvA or at one of the IMABEE partner universities.

The Examination Board Health and Life Sciences-Earth Ecological and Environmental Sciences (EB HLS-EEE) of the Faculty of Science is responsible for guaranteeing the quality of assessment within the programme. As the MSc MPA also falls under the remit of the EB HLS-EEE, this means it is also responsible for the quality of assessment in the C and M specializations. The EB HLS-EEE consists of a chair, an external member and nine sub-boards of examiners with a maximum of four members each. Each sub-board is responsible for a (cluster of) study programme(s). The MSc Ecology programme shares a sub-board of examiners with the BSc programme in Biology. The nine sub-boards meet ten times a year. The EB HLS-EEE has developed quality assurance procedures for the evaluation of assessments. For a number of programmes, including the MSc in Ecology, the EB HLS-EEE has installed an assessment committee that is responsible for the quality assurance of assessments. Each year, the assessment committee evaluates a selection of assessments and the accompanying grading forms. The assessment files form the basis for this evaluation. All the Health and Life Sciences assessments are evaluated over an eight-year cycle. In addition, a selection of theses and grading forms is evaluated by the sub-examination board yearly. The panel is of the opinion that the EB HLS-EEE does an excellent job safeguarding the quality of assessment and the realized learning outcomes.

During the site visit, the panel discussed the impact of the COVID-19 pandemic on assessment in the programme with representatives of the EB HLS-EEE and the assessment committee, as well as with the lecturers. Based on these discussions and the documentation provided, the panel concludes that the EB HLS-EEE was closely involved in adapting the assessment to distant education during the pandemic. Adjustments to assessment forms, the organization of assessments and the administration of exams have been closely monitored. In addition, the EB HLS-EEE adopted an advisory role and supported lecturers by, for example, sharing best practices.

Cooperation between VU Amsterdam-UvA and the double degree

Within the context of the cooperation with UvA, the EB HLS-EEE works together with the UvA Examination Board (UvA EB) on the basis of mutual transparency and trust. The EBs have yearly formal contact to discuss the quality assurance of assessments, literature theses, internships and exchange procedures for the courses

offered at each university. This is important for remaining informed about the procedures and methods at the other university. Taking into account that the TERs and R&Rs are also coordinated at the university level, the panel acknowledges the merits of this hands-on approach. As for the IMABEE-specialization, the Cooperation Agreement of the consortium indicates that in the second year, the host university is responsible for the quality of assessment of its own courses. During the site visit, the panel learned that VU Amsterdam works together with the consortium partners on the basis of trust and has no specific checks in place for the evaluation of curriculum elements at partner universities other than for the thesis. The panel understands this is because the partners are all ESG-accredited. The EB HLS-EEE is legally responsible for safeguarding the quality of all programme elements contributing to the VU Amsterdam diploma, including those organised at the IMABEE partner universities. The panel thinks it is, therefore, advisable to regularly check whether assessment policies at partner universities are still in line with VU policies and quality standards. For instance, VU Amsterdam could keep itself informed about the results of evaluations of the partner programmes, as this would be in line with the formal contact that takes place between the VU Amsterdam and UvA EBs.

Considerations

The panel concludes that assessment in the MSc Ecology programme is in accordance with faculty and university regulations and the programme assessment plan. The assessment for all the specializations under review adequately covers the learning objectives and the ILOs. The panel is satisfied with the quality of assessment in the programme. Assessments are generally valid, reliable, and transparent, meeting the standards. The panel is also satisfied with the assessment methods, which are varied and well-chosen.

The panel considers the assessment procedure of the final projects adequately designed in all specializations under review. The panel is satisfied with the assessment and grading of the final projects in each specialization. The panel does, however, feel that the transparency of grading could be further improved for the E&E specialisation. The E&E assessment form consists of various aspects of assessment (Report/Article, Attitude, Execution/Project Methodology, Presentation). For each aspect of the internship/research project (e.g., Report/Article), adequate and often extensive *overall* feedback is provided, which the panel highly appreciates. However, this (written) feedback is often missing at the level of the assessment criteria. The panel recommends the programme ensure that, when using the rubrics, adequate substantiation for the assessment of each criterion be provided. Moreover, the panel advises the programme to increase the transparency of the grading process. The panel also recommends assessing the oral presentation with a second assessor.

The panel concludes that adequate measures are in place to assure the quality of assessment and that the quality assurance procedures for the evaluation of assessments are appropriate. The EB HLS-EEE, supported by the assessment committee, does an excellent job safeguarding the quality of assessment and the end level. It was closely involved in adapting the assessment to distant education during the pandemic and the panel appreciates the advisory role it adopted to support staff during these trying times.

Finally, the panel concludes that the cooperation with UvA is based on mutual transparency and trust. The panel acknowledges the merits of the hands-on approach, which works well for both parties. The collaborations with the IMABEE consortium partners take place primarily on the basis of trust. Although the partners are all ESG-accredited, given the examination board's legal responsibility, the panel thinks it is advisable to regularly check whether assessment policies at partner universities are still in line with VU policies and quality standards.

On the whole, the panel concludes that the programme has an adequate system of student assessment in place.

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

The panel studied a representative selection of fifteen final projects and theses from the MSc Ecology programme. This selection represented all four specializations under review (see Appendix 4). For the IMABEE specialization, the selection only contained theses from incoming students (see Appendix 4). Based on the selection, the panel concludes that all final projects and theses demonstrate the realisation of the programme's ILOs. They are clearly of the level and quality that may be expected from an MSc thesis in the field of ecology and evolution. The theses of the C and M specializations also clearly reflect their own signature. The panel is pleased to see that the theses produced in the programme cover a wide variety of topics and included both field and lab projects. The research is up-to-date and clearly embedded in the scientific literature. Ongoing research at VU Amsterdam and UvA reflects the current research questions in ecology and evolutionary biology. Moreover, the panel is impressed by the often high level of statistical analysis. The panel appreciates that the theses often have research questions of societal importance, especially related to sustainability. The panel notes that the theses are not paying much attention to societal relevance of research results.

Alumni praise the fundamental orientation and think it is a clear asset of the programme. The alumni who continued their studies and went on to earn a PhD felt very well equipped by the research experience they gained during the MSc programme. Alumni currently working in a more applied setting find the fundamental orientation valuable as well, as they feel it gives them the needed substance. This, in the panel's eyes, highlights the importance of the two lengthy research projects/internships.

While many alumni find PhD positions both in the Netherlands and abroad, a substantial number of alumni start their careers in commercial research, nature management, policy or consultancy. Alumni of the C specialization often find employment as science journalists, communication advisors or content managers at a science museum, while alumni of the M -specialization find jobs as consultants, policy-makers, (academic) researchers or entrepreneurs at the interface of science, technology and society. On the whole, the alumni look back on the programme with great satisfaction and feel the programme prepared them well for their careers.

Considerations

The panel concludes that the final projects and theses of the MSc Ecology programme demonstrate the realisation of the programme's ILOs. They are clearly of the level and quality that may be expected from an MSc thesis in the field of ecology and evolution. The theses of the C and M -specializations also clearly reflect their own signature. The panel is pleased to see that the theses covered a wide variety of topics, included both field and lab projects and reflected the current research questions in ecology and evolutionary biology.

The alumni look back on the programme with great satisfaction and feel the programme prepared them well for their careers. They find employment in relevant jobs in the Netherlands and abroad, both inside and outside academia.

Conclusion

The panel concludes that the programme meets Standard 4.

General conclusion

The committee's assessment of the MSc Ecology programme is positive.

Development points

1. The panel suggests that the programme discuss with the PAB what the PAB views the programme's most unique selling points to be and to use this information to communicate the programme's profile even more distinctly to the outside world.
2. The panel suggests including an ILO regarding fieldwork. Furthermore, the panel suggests considering specific ILOs or a further concretization of ILOs for the M and C -specializations. Although the current ILOs sufficiently cover these specializations, the ILOs could be made more explicit in terms of the knowledge and skills offered by the C and M -specializations.
3. Particularly in the E&E specialization, preparation for the professional labour market outside academia could benefit from further attention. More direct experience with working in applied settings and training of professional skills would be advisable.
4. The diversity in the international classroom could be made better use of to stimulate students' intercultural awareness and skills. By drawing on students' diverse cultural backgrounds (e.g. cultural and religious differences, differences in perspectives), lecturers could use diversity as a resource for teaching.
5. Using diversity as a resource for teaching by drawing on students' diverse cultural backgrounds and perspectives could stimulate students' intercultural awareness and build intercultural skills.
6. Supervisors could be more active in helping students prevent project delays, in particular relating to the amount of time spent on experiments.
7. Specifically for the E&E specialization, the panel concludes that the transparency of grading could be further improved. The panel recommends the programme ensuring that, when using the rubrics, adequate substantiation for the assessment of each assessment criterion of the various aspects of the internship or research project (e.g., Report or Article) is provided. Moreover, the panel advises that the transparency of the grading process be increased. In addition, the panel recommends assessing the oral presentation using a second assessor.
8. Although the IMABEE partners are all ESG-accredited programmes, given the examination board's legal responsibility, the panel thinks it is advisable to regularly check whether assessment policies at the partner universities are still in line with VU policies and quality standards.

Appendix 1. Intended learning outcomes

Dublin descriptor 1: Knowledge and understanding

The graduate should have specialized theoretical and practical knowledge of ecological and evolutionary science notably within the field of his/her specialization.

The graduate:

- 1 masters the field's conceptual framework, understands the state of the art in terms of developing theories and has insight into the most important current research issues in ecology and evolution,
- 2 appreciates the place of this discipline within Biology and the Natural Sciences,
- 3 appreciates the scientific and social relevance of ecology and evolution,
- 4 is able to think in multidisciplinary terms,
- 5 has sufficient knowledge of and is able to apply appropriate mathematical and statistical methods and computer software.

Dublin descriptor 2: Application of knowledge

The graduate should be experienced in carrying out research, in applying techniques specific to the subject area and in applying scientific knowledge to problems raised in society.

The graduate:

- 1 is able to design and perform experiments in the different ecological and evolutionary fields and analyse their results,
- 2 has command of the relevant advanced research techniques and laboratory procedures,
- 3 is able to transmit his/her scientific knowledge to societal and political issues,
- 4 is able to reflect on the ethical aspects of research and its uses.

Dublin descriptor 3: Critical judgment

The graduate should be able to independently and critically judge information.

The graduate:

- 1 is able to independently and critically analyse ecological and evolutionary research,
- 2 is able to independently acquire, analyse and critically evaluate ecological and evolutionary information from the literature at a meta level,
- 3 has the ability to evaluate his/her own performance, both introspectively and in discussion with others.

Dublin descriptor 4: Communication

The graduate should be able to transfer knowledge and skills related to his/her subject area to other persons and to adequately reply to questions and problems posed within society.

The graduate:

- 1 can report orally on research results to a scientific audience in English with support of modern presentation techniques,
- 2 can report in written form on research results on the level of peer-reviewed academic journals (in English),
- 3 can make essential contributions to scientific discussions,
- 4 can operate professionally in a research team.

Dublin descriptor 5: Learning skills

The graduate should develop learning skills that enable him/her further self-education and development within the subject area.

The graduate:

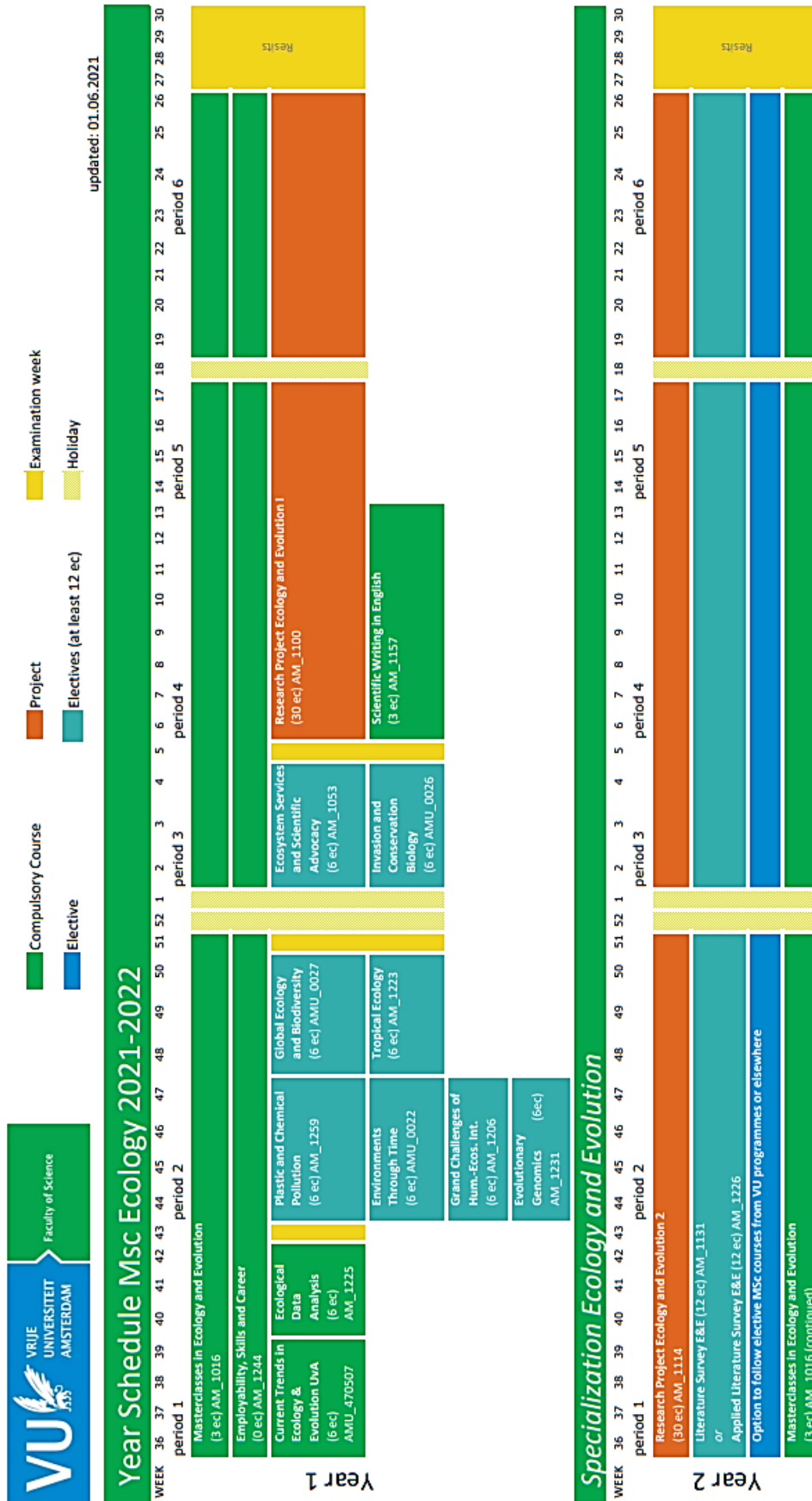
1 is able to draw up a research proposal developing new research questions and directions, giving details of experimental design, performance and analysis,

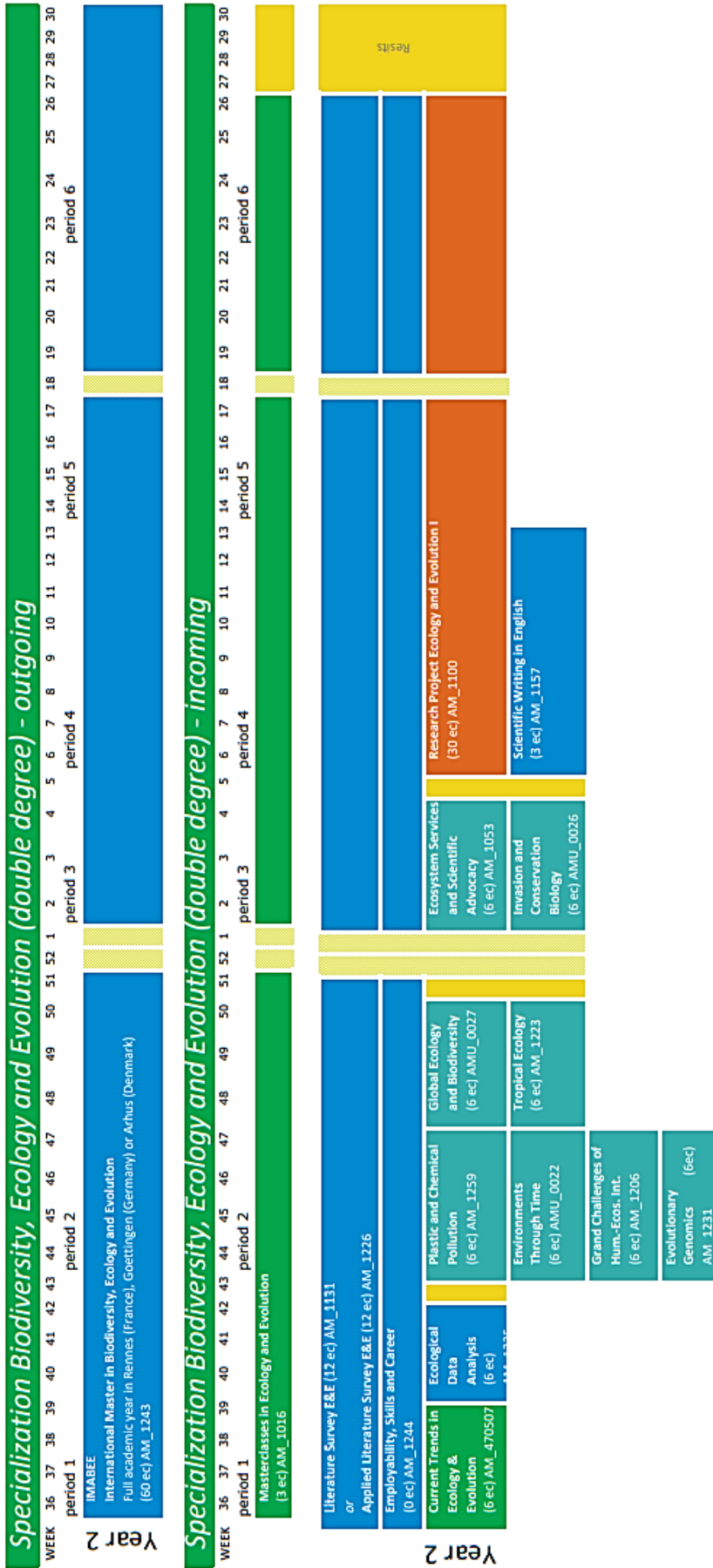
2 is familiar with high-impact general scientific journals as well as professional journals in ecology and evolution,

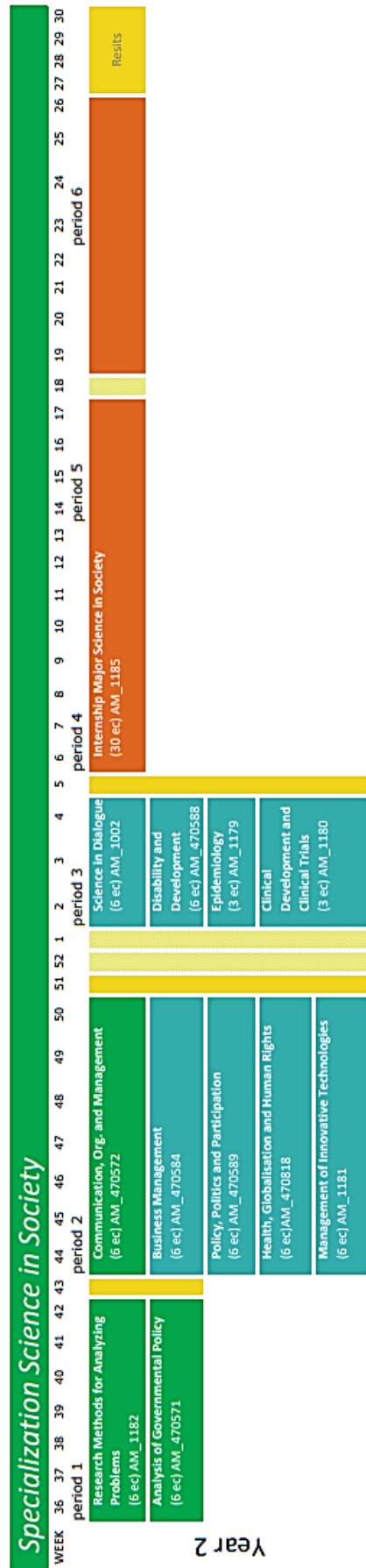
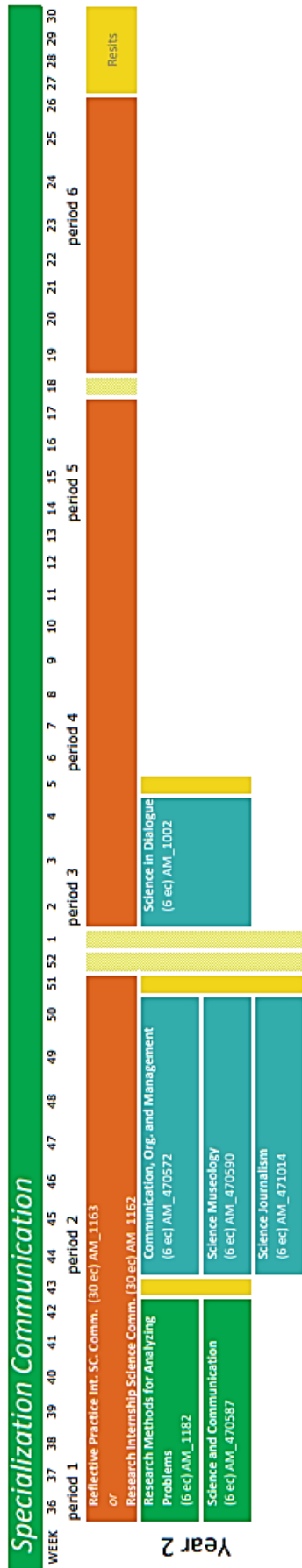
3 able to evaluate and reflect on scientific contributions of peers,

4 can make a well-considered choice for a specialized PhD trajectory or other positions on the job market

Appendix 2. Programme curriculum









students can choose electives from the Ecology and Evolution specialization

Results	P1	P2	P3	P4	P5	P6
Information Sciences	wk 2	wk 7/8/9	wk 14	wk 23	wk 27	wk 29/34
Natural Sciences & Mathematics	wk 2	wk 7/8/9	wk 14	wk 23	wk 27	wk 29/34
Health & Life Sciences	wk 2	wk 7/8/9	wk 14	wk 23	wk 27	wk 29/34
Earth, Ecological & Environmental	wk 2	wk 7/8/9	wk 14	wk 23	wk 27	wk 29/34

Appendix 3. Programme of the site visit

Dinsdag 2 november 2021		
9.30	9.45	Aankomst panel – welkom
9.45	10.30	Vorbereidend overleg en inzien documenten
10.30	11:15	Open spreekuur/ inzien documenten
11.15	11.35	Gesprek met formeel en inhoudelijk verantwoordelijken (bachelor en master) <i>Vice-decaan onderwijs</i> <i>Opleidingsdirecteur M Ecology</i> <i>Opleidingsdirecteur B Biologie en opleidingscoördinator M Ecology</i> <i>Opleidingscoördinator B Biologie</i> <i>Voormalig opleidingsdirecteur B Biologie (tot april 2021)</i>
11.35	12.15	Gesprek met inhoudelijk verantwoordelijken (bachelor en master)
12.15	12.30	Paneloverleg
12.30	13.15	Lunch
13.15	14.00	Gesprek met studenten bachelor
14.00	14.45	Gesprek met docenten bachelor
14.45	15.15	Paneloverleg
15.15	16.00	Gesprek met studenten master <i>Voertaal: Engels</i>
16.00	16.45	Gesprek met docenten master
16.45	17.00	Paneloverleg
17.00	17.45	Gesprek alumni master en vertegenwoordigers werkveld

Woensdag 3 november 2021		
8.45	9.00	Aankomst panel
9.00	9.30	Vorbereidend overleg en inzien documenten
9.30	10.15	Gesprek examencommissie (2 opleidingen)
10.15	10.45	Paneloverleg
10.45	11.30	Themasessie bacheloropleiding – Curriculumherziening <i>Opleidingsdirecteur</i> <i>Opleidingscoördinator</i> <i>Lid opleidingscommissie</i> <i>Voorzitter examencommissie</i> <i>Student-lid opleidingscommissie</i>
11.30	11.45	Paneloverleg
11.45	12.30	Themasessie masteropleiding – Curriculumopbouw en studentaantallen <i>Opleidingsdirecteur</i> <i>Opleidingscoördinator</i>
12.30	13.15	Lunch
13.15	14.00	Inzien documenten
14.00	14.45	Vorbereiden eindgesprek formeel verantwoordelijken
14.45	15.15	Eindgesprek formeel verantwoordelijken
15.15	16.15	Opstellen voorlopige bevindingen
16.15	16.30	Vorbereiding mondelinge rapportage
16.30	17.00	Mondelinge rapportage voorlopig oordeel

Appendix 4. Materials

Prior to the site visit, the committee studied 16 theses for the MSc Ecology. Information on the theses is available from Academion upon request. The committee also studied other materials, which included:

Short self-evaluation report
Student chapter

Domain specific framework
Exit qualifications
Professional Advisory Board composition
NIBI werkgeversonderzoek 2021 rapport
IMABEE agreement 2016-2020
IMABEE agreement 2021-2025
Samenwerkingsovereenkomst UvA
Raamwerk samenwerking UvA
Accreditation report VU wo-ma Management Policy Analysis and Entrepreneurship in the Health and Life Sciences

Year schedule 2021-2022 M Ecology
Study guide
TER 2021-2022 M Ecology
List teaching staff M Ecology
NSE resultaten per thema 2021 M Ecology
Annual reports Programme Committee
Quality Assurance Policy Faculty of Science

Course information 'Ecological Data Analysis' and 'Current Trends in Ecology & Evolution'
Toetsbeleid Faculteit der Bètawetenschappen 2019
Regels en Richtlijnen van de examencommissie 2020-2021
Assessment plan 2021-2022 M Ecology
Assessment matrix 2021-2022 M Ecology
Werkwijze toetscommissie
Annual reports Examination Board
Placement manual research projects M Ecology
Placement manual major Science in Society
Placement manual Science Communication
Evaluation form VU supervisor
Evaluation form second assessor