DE ONDERWIJSVISITATIE
Toegepaste Biologische Wetenschappen (boek 2)

Een evaluatie van de kwaliteit van de academische opleidingen
Toegepaste Biologische Wetenschappen

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DE ONDERWIJSVISITATIE
TOEGEPASTE BIOLOGISCHE WETENSCHAPPEN

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MASTERS DEEL 2

BIJLAGEN

VERIFIEERBARE FEITEN[1]

Hoofdstuk I	Bezoekschema's
Hoofdstuk II	Lijst met de opleidingsspecifieke leerresultaten in relatie tot de gevalideerde domeinspecifieke leerresultaten opgesteld volgens de handleiding van de VLUHR, indien beschikbaar, en/of in relatie tot de Vlaamse Kwalificatiestructuur
Hoofdstuk III	Schematisch programmaoverzicht met vermelding van het aantal studiepunten per opleidingsonderdeel
Hoofdstuk IV	Omvang van het ingezette personeel in VTE, ingedeeld naar categorie van aanstelling
Hoofdstuk V	Instroomgegevens, doorstroomgegevens en totaal aantal studenten
Hoofdstuk VI	De studieduur tot het behalen van het diploma per instromende cohorte en de gemiddelde studieduur per afstuderende cohorte
Hoofdstuk VII	Overzicht van de belangrijkste activiteiten van de opleiding met betrekking tot internationalisering conform de visie van de opleiding, met minimaal de mobiliteit op basis van internationaal aanvaarde definities

1 De verifieerbare feiten zijn terug te vinden op www.vluhr.be/kwaliteitszorg

DEEL 4

Opleidingsrapporten Masters deel 2

VRIJE UNIVERSITEIT BRUSSEL
Master of Science
in Biomolecular Sciences

SUMMARY
Master of Science in Biomolecular Sciences
Vrije Universiteit Brussel

From 28–29 April 2014, the Master of Science in Biomolecular Sciences at VUB has been evaluated in the framework of an educational assessment by a peer review panel of independent experts. In this summary which describes a snapshot, the main findings of the panel are listed.

Profile of the programme

The programme aims to develop students' knowledge and understanding of the functioning of all forms of life at the molecular and cellular level. It is a unique study programme in Flanders, with a particular focus on applied immunology, advanced molecular biology, protein structure and function, as well as the ability to apply bioinformatics in these fields.

The programme offers two variants: a curriculum instructed in Dutch or English. The Dutch variant has never been followed by a single student.

Programme

The programme counts 120 ECTS and consists of two years. The curriculum of the first year is fixed for all students. Lectures are on Thursday and Friday, while lab-work/exercises take place on Monday, Tuesday and Wednesday.

The first year courses are grouped into four sub-domains: Protein structure and function, Applied immunology; Advanced molecular biology, Bioinformatics. In the second year, students have to follow four elective courses (5 credits each), while the remaining credits go to a compulsory course 'Research communication and management' (10 credits) and the Master thesis (30 credits).

In the second year students have to prepare and defend a master's thesis, write a scientific publication based on the results obtained during their thesis work, and write a PhD project proposal.

Face-to-face lecturing is the most common teaching form. Acquisition of knowledge in the second year mainly occurs through conventional lecturing and self-study. Each course is accompanied by practical labwork and/or exercises. Given the very small number of students, the classes are nearly private teaching sessions. The current teaching methods are not sufficiently adapted to the small groups.

Evaluation and testing

In the first year the most common evaluation form is oral examination with written preparation, although for some courses oral examination or written examination with open or closed questions are also used. Since every course in the first year consists of a theoretical and a practical part, practicals are also evaluated. This is mostly based on written reports or assignments, sometimes in combination with observation of the students during the practical training sessions. During the oral examinations questions about the practicals can also be asked.

In the second year, the oral examination form predominates, although oral evaluation with written preparation is still used. For the self-studies, evaluation of written assignments is often used. The master's thesis has to be defended before a jury.

Services and student guidance

At the start of the academic year, an information meeting is organised by the scientific-administrative coordinator. On this occasion, the newcomers are informed about the structure and content of the programme, the examinations, and the objectives of the programme. During their studies, the students can always rely on the lecturers whenever they meet problems with course contents. Contacts between lecturers and students

are open. An ombudsperson is available whom the students can contact when problems arise related to examination procedures and assessments.

At university level the Study Guidance Center (SGC) offers study guidance to all students.

The programme is organised on Campus Etterbeek in Brussels. Practical trainings and the experimental work for the master's thesis all take place in research labs of VUB. All these labs are equipped to meet international standards for research.

Study success and professional opportunities

Of the 25 students that have enrolled in the programme, 22 obtained their diploma: 19 students after two years and the remaining 3 after 2.5 years. The average study yield is 90.8%. Over the years there has been a slight decrease in study yield, because of the tendency to defend the master's thesis in January of the third year. Even so, the pass rate remains quite high.

Graduates are employable in different types of jobs such as the medical, pharmaceutical and biotechnological industries, both in research, production and quality control functions; academic research laboratories; hospital and medical labs; science education and training; Research and Development departments of academic institutions and industries; management; science journalism; patent law offices; and governmental organisations.

After graduation, about half of the respondents started PhD studies.

ASSESSMENT REPORT
Master of Science in Biomolecular Sciences
Vrije Universiteit Brussel

Preface

This report concerns the Master of Science in Biomolecular Sciences at Vrije Universiteit Brussel (VUB). The assessment panel visited the study programme from 28 to 29 April 2014.

The panel assesses the study programme on the basis of the three generic quality standards (GQSs) of the VLUHR programme assessment framework. This framework is designed to fulfil the accreditation requirements set by the NVAO. For each generic quality standard, the panel gives a weighted and motivated judgement on a four -point scale: unsatisfactory, satisfactory, good or excellent. In the assessment of generic quality assurance, the concept of 'generic quality' indicates that the GQS is in place and that the programme – or a specific mode of the programme – meets the quality level that can reasonably be expected, from an international perspective, of a Master's programme in higher education. The score 'satisfactory' indicates that the programme meets the generic quality because it demonstrates an acceptable level for the particular GQS. If the study programme scores 'good', the programme systematically exceeds the generic quality for that standard. If the programme scores 'excellent', it achieves well above the generic quality for the particular GQS and serves as an (inter)national example. The score 'unsatisfactory' indicates that the programme does not attain the generic quality for that particular GQS.

The panel's opinions are supported by facts and analyses. The panel makes clear how it has reached its opinion. The panel also expresses a final opinion on the quality of the programme as a whole, also according to the same four-point scale. Judgements and recommendations relate to the programme with all subordinate modes or majors, unless stated differently.

The panel assesses the quality of the programme as it has been established at the time of the site visit. The panel has based its judgement on the self-evaluation report and the information that arose from the interviews with the programme management, lecturers, students, alumni and personnel responsible at programme level for internal quality assurance, internationalisation, study guidance and student tutoring. The panel has also examined the course materials, master's theses, test and evaluation

assignments and standard answering formats, and numerous relevant reports available. For the student success rate, the panel has relied on the DHO tables. The panel has also visited the educational specific facilities such as classrooms and the library.

In addition to its judgement, the panel also formulates recommendations with respect to quality improvement. In this manner, the panel wants to help improve the quality of the programme. The recommendations are included in the relevant sections of the respective generic quality standards. At the end of the report an overview is given of improvement suggestions.

Context of the study programme

The Master of Science in Biomolecular Sciences consists of 120 ECTS credits, spread over two years. The programme (all variants) has 13 students enrolled (2012–2013). The programme offers two variants: a curriculum instructed in Dutch or English. According to the Self Evaluation Report (SER) the Dutch variant has never been followed by a single student, nor have any prospective students enquired about it. The programme is embedded in the department of Applied Biological Sciences of the Faculty of Science and Bio-engineering Sciences of the Vrije Universiteit Brussel (VUB). The department is also responsible for the programmes Master of Science in Molecular Biology and the Bachelor and Master of Science in Applied Bio-Engineering. The programme is housed on Etterbeek campus.

The programme finds its origin in the "Graduate School in Molecular Biology and Biotechnology" that was founded in 1989. Initially this programme was intended to give PhD students of the Institute of Molecular Biology and Biotechnology the opportunity to broaden and update their knowledge in domains of molecular biology and biotechnology different from their specialisation. Soon the programme was also followed by PhD students from other Flemish universities, as well as by scientists employed in industry, education, public sector and so on. Over the years, the Graduate School was also attended by an ever increasing number of students from other European countries and countries from the South. From the academic year 2007–2008 on, the former programme was reshaped into a two-year full-time programme with a strong emphasis on research. It aimed to attract students from Belgium and especially from other European countries.

The programme is managed by the Educational Board, consisting of the members of the formal steering committee, plus representatives of the students (one from the first and one from the second Master), one AAP, one alumnus and one representative of the ATP. The Educational Board is an advisory board to the board of the Department of Bio-engineering Sciences and discusses on the following matters: changes in the programme; the identification of course leaders (the latter being ZAP members of VUB) and lecturers who may assist the course leaders in their educational tasks; the content, form, consistency and feasibility of the study programme; quality monitoring and quality improvement of the study programme; preparation of assessment visits.

Generic quality standard 1 - Targeted Outcome Level

The assessment panel evaluates the targeted outcome level for the Master of Science in Biomolecular Sciences as satisfactory

According to the SER, Biomolecular sciences is a discipline that focuses on the analysis and understanding of biomolecules and their interplay, which should result in a better comprehension of the diversity of cellular processes and their regulation. By biomolecules the programme management means all molecules that are produced by living organisms, in the first place macromolecules such as proteins, nucleic acids, polysaccharides, lipids, but also small molecules (e.g. secondary metabolites, etc.). As such, studying the 'unity of the phenomenon of life' is central to this discipline. Therefore, the Master of Science in Biomolecular Sciences aims to develop students' knowledge and understanding of the functioning of all forms of life at the molecular and cellular level.

The master in Biomolecular Sciences is a unique study programme in Flanders. It is designed to give the participants an advanced knowledge of and practical skills in different areas of biomolecular sciences. According to the SER, the students should have developed an open mind and a critical and self-critical attitude towards research and its applications. They should be able to take initiatives, to communicate both in writing and orally, have developed the skills to perform research, have an advanced knowledge in their discipline, be able to function in a multidisciplinary and international context, be able to disseminate their acquired knowledge and skills in professional activities such as research, education and policy making, be able to reflect on the application of scientific knowledge and be aware of the ethical aspects of research and publication.

This profile has been translated into 10 programme-specific intended learning outcomes. They stipulate, among other things, that graduates have to able to write a scientific publication and to set up an original PhD research proposal. It is further outlined that the programme will focus on applied immunology, advanced molecular biology, protein structure and function, as well as the ability to apply bioinformatics in these fields. As a unique programme in Flanders, the programme has implemented the Domain-specific Learning Outcomes directly without any modification or addition as programme-specific learning outcomes. Therefore the Programme-specific Learning Outcomes comply with the Flemish qualification framework and – evidently – with the domain-specific learning outcomes too. The SER claims that part of the current programme-specific learning outcomes have been defined on the basis of recommendations by the previous assessment panel (2006). Other sources of input are not mentioned.

The programme management argues that the philosophy behind the current program is a research oriented and research driven education. Therefore, the focus of the topics that are being covered closely connect to major research spearheads of the department: immunology, protein structure/function, advanced molecular biology and microbiology, and bio-informatics. Despite the benchmarking with similar programmes, the panel finds that there is not enough reflection on the programme-specific learning outcomes. There is no trace of opinions from (external) experts. As a matter of fact, the panel recommends to explain more clearly the vision and the focus of the programme and if necessary to reconsider this vision and focus and to adapt the programme. The panel further suggests to give non-communicable diseases more attention. More generally social and economic aspects should also be an integral part of the learning outcomes.

After comparing its programme-specific learning outcomes with those of related study programmes in the Netherlands and the United Kingdom, the programme has come to the conclusion that all are 'very similar' (although all have also their particular characteristics). The assessment panel itself finds that, in international perspective, the learning outcomes are sufficient. The panel appreciates the high ambitions regarding research skills, illustrated by the fact that students have to be able to write a scientific publication and set up an original PhD research proposal. This fits well with the specific profile of the programme.

According to a survey among alumni, about 91% were familiar with the programme objectives at the start of the programme. The remaining 9% responded that the objectives became clear to them in the course of the programme.

A problem that has been signalled by the SER itself is the limited visibility of the programme. As will be described further on in this report, the student intake has become dramatically low. . The panel would encourage the management to engage in comprehensive and complete national and international benchmarking of the programme's learning outcomes. Such benchmarking training offers the potential to strengthen the programme's profile on the basis of facts and figures. A full and thorough benchmarking exercise provides a lot of information for the further profiling and positioning of the programme both at home and abroad, and offers opportunities to communicate the profile of graduates in a clear manner to the employment market. The panel considers it necessary to position the programme better internationally. The establishment of long-term and structured collaborations would be helpful. A necessary step to this is getting more involvement from the alumni and more efforts on the part of the staff and institution to promote, increase and optimise the visibility of the programme.

In conclusion, the panel finds that the programme learning outcomes comply with all formal requirements. The panel appreciates the high ambitions regarding research skills, but sees opportunities to give more attention to social and economic aspects and topics such as non-communicable diseases.

Generic quality standard 2 - Learning Process

The assessment panel evaluates the learning process for the Master of Science in Biomolecular Sciences as satisfactory

The programme of the English variant counts 120 ECTS and consists of two years. The courses of the first year give the students a sound and in-depth knowledge of a variety of disciplines related to the research spearheads included in the programme, i.e. protein structure and function, applied immunology, advanced molecular biology, and bioinformatics. In the second year, highly specialised electives allow students to acquire specific and in-depth knowledge in a selected number of domains. In addition to the acquisition of knowledge, much attention is paid to developing the

practical skills of the students to become competent researchers. Training is provided in Practical skills in research laboratories of the course leaders. Training in research labs confronts the students early in their study with the reality of scientific research and contributes to the development of good research attitudes. During the practicals students are also trained in communication skills and team-working through oral and written reporting and group discussions.

The curriculum of the first year of the English variant is fixed for all students. The first-year courses are grouped into the four sub-domains (Protein structure and function; Applied immunology; Advanced molecular biology; Bioinformatics). Lectures are on Thursday and Friday, while lab-work/exercises take place on Monday, Tuesday and Wednesday. Within each sub-domain, the courses are scheduled in such a way that they are either independent of each other, or are organised sequentially when important parts of one course are required to understand the following ones. In the **second year**, students have to follow four elective courses (together 20 ECTS) that can be chosen to increase their knowledge in preferred domains of biomolecular sciences. The remaining credits go to a (compulsory) course unit 'Research communication and management' (10 ECTS). In the second year students have to prepare and defend a master's thesis, write a scientific publication based on the results obtained during their thesis work, and write a PhD project proposal. The latter two are assignments in the context of the course unit 'Research communication and management'.

Face-to-face lecturing is the most common teaching form. Acquisition of knowledge in the second year mainly occurs through conventional lecturing and self-study, the latter being an important part of each course unit. From the e-learning exercises students have to make a written summary and/or present orally during the examination. Each course is accompanied by practical labwork and/or exercises. During the practical labwork the students become acquainted with the techniques that are used in the respective research domains. They learn to perform experiments, work together in teams, interpret results obtained, write lab reports and present their results orally. Given the very small number of students, the classes are nearly private teaching sessions. Students admit that some of these classes are interactive, but this is not generally the case. The panel argues that students should be more challenged. The current teaching methods are not sufficiently adapted to the small groups. The panel considers it necessary for more activating teaching methods adapted to small groups

to be implemented at short notice. E-learning can play a major role in this, as the SER itself confirms that the electronic learning platform Pointcarré is 'not used to its full capacity'.

The practicals are appreciated by the students. They gain a flavour of advanced research that is in progress in the labs of the academic staff. The panel recommends strengthening the relationship between theory and practice in order to enhance the learning effect for students. The practical training during the first year is of special importance to prepare the students for their experimental work during the master's thesis.

The students have freedom to choose the topic of their thesis, as long as it contributes to knowledge in the field concerned. Thesis topics can be identified during the practical trainings of the first year in the research labs, or during a thesis fair that is organised annually. The experimental part of the master's thesis starts at the beginning of the second year. During the preparation of the thesis, students participate in lab meetings where they report on the experiments performed and the results obtained and suggest and discuss future experiments with their (co)promoter(s), supervisor(s) and other lab members. Students can rely on these staff members at all times for advice, feedback and guidance. According to an alumni survey, there is enough choice of thesis topics, supervision is excellent to good, and so is the access to research infrastructure. The alumni were also happy with the cooperation with professionals and researchers and they felt well prepared during the practicals to embark for the experimental work.

The intended learning outcomes are sufficiently reflected in the content of the curriculum. Acquisition of theoretical knowledge and practical experience is at a high level. The courses are also built on ongoing research. One problem, however, is the limited list of **elective courses**. In theory students can propose alternative courses by themselves, but they would prefer that the existing list of elective courses offered should be longer. They have their own interests, and particularly want electives that are more in line with their master's thesis. The panel recommends that the programme should be tailored more closely to the quality and ambitions of the students. Ideally the programme managers themselves should present a list of potential electives. Making more use of electives from the Medical Sciences faculty might be a good starting point.

Regarding the **study load**, relevant statistical evidence from surveys is lacking due to the small number of students. A survey among alumni

learned that 90% perceive the study load as 'normal' and 10% as 'heavy'. The students that were interviewed by the assessment panel called the study load intensive (especially in the first year), 'but acceptable'. The programme has had three drop-outs since its start, all due to 'personal problems'.

All **staff members** involved in the programme are ZAP members of VUB. Teaching and research assistants and, if applicable, technical staff members are involved in guiding the students during labwork and the preparation of their master's thesis. These co-workers are directly guided by the responsible academic staff members. Moreover, the programme can also rely on many young PhD researchers and post-docs. The assessment panel is impressed by the high quality of (research) expertise of the staff. All staff members are involved in research related to the items they are teaching. At the time of the assessment 20 ZAP members were partially involved in the programme, in addition to 17 'co-workers' (AAP, BAP, PhD students, etc.). Given the low number of students, the **capacity of the staff** is sufficient to guarantee both their theoretical and practical education.

Until 2012, special training for starting lecturers was organised at VUB. In 2013, the educational seminar was replaced by a comprehensive 90-hour path for (new) teachers' **professional development**. This initiative will be compulsory from 2014–2015 onwards for all new ZAP members. The panel considers it essential for the programme committee to adopt a proactive approach to the detection of professional development needs and the provision and/or facilitation of a focused professional offering, primarily around interactive teaching for small groups. It would therefore recommend addressing the current situation in order to develop a team-oriented professional development policy starting from the needs of the programme.

The **intake criteria** are clear. Holders of a bachelor's degree (in various related disciplines) from a Flemish university have direct access to the programme. For all other applicants, admission can be granted after consideration of an application file by the steering committee. For students outside the EEA, proof of English proficiency is compulsory. Since the academic year 2012–13, all prospective students have had to first fillout a pre-application form. If they receive a positive answer, they are invited to proceed to the final application. Until now, most students have been of Polish, Greek or Belgian origin. The majority of students are women. According to an alumni survey, students mainly choose the

programme because of 'intrinsic interest', and also because of the design of the programme. Professional opportunities are rather minor concerns. When interviewed by the assessment panel, graduates also mentioned the low subscription fee as a reason to opt for this programme. According to the SER, the programme is 'quite attractive' for students from abroad who visit the university as **exchange students**, mainly in the context of Erasmus programmes. These students come from European universities with which VUB has bilateral agreements. Typically, they come for one semester and exceptionally for two semesters to follow course units that can be considered equivalent to those they would have followed at home. Even so, sometimes individual programmes have to be compiled.

At university level the Study Guidance Center (SGC) offers study **guidance** to all students. At the start of the academic year, an information meeting is organised by the scientific-administrative coordinator. On this occasion, the newcomers are informed about the structure and content of the programme, the examinations, and the objectives of the programme. During their studies, the students can always rely on the lecturers whenever they meet problems with course contents. Contacts between lecturers and students are open, and students appreciate this very much. An ombudsperson is available whom the students can contact when problems arise related to examination procedures and assessments. However, virtually any kind of problems students deal with are discussed and solved by the scientific-administrative coordinator.

Based on the self-evaluation report, the documents available for viewing and discussions, the panel concludes that the programme has a serious problem with the intake of students. The programme is not sufficiently visible and known in the European Higher Education Area. There is a great need for long-term, structural collaborations to increase the number of applications. Because of the low intake, the viability of the programme is in serious danger. T. The panel observed, as was also specified in the self-evaluation report, that the low student numbers might be a possible threat for the continuing motivation of the teaching team. The panel recommends the management to promote the programme through an active PR campaign by the staff and the institution. The panel sees great opportunities to radically change the approach to online publicity and communication to possible students and partner-institutions. However, the panel sees insufficient policymaking capacity within the programme management to form a clear action plan to address the identified intake problems. The panel therefore considers it necessary both to strengthen

the policymaking capacity and to make serious progress on a recruitment plan so as to increase the intake to an acceptable level.

The assessment panel is satisfied with the **material facilities** of the programme, which is organised on Campus Etterbeek in Brussels. Practical trainings and the experimental work for the master's thesis all take place in research labs of VUB. All these labs are equipped to meet international standards for research. Surveys among students and alumni pointed out that the labs are well equipped, with easy access to the equipment available. All students have free access to the libraries and the electronic library of VUB. Moreover, students can also borrow books from the IPMB (molecular biology) library. The IPMB library contains several copies of the books that lecturers use in their classes or that students can consult for further reading and to prepare assignments. However, since this library is especially intended for IPMB students, the latter have priority. The SER signals that students of Biomolecular Sciences are not satisfied with the access to **textbooks**. Even with the small student numbers, this shortage seems to be an annoying problem.

The **Educational Board** of the study programme, consisting of the scientific-administrative coordinator and the leaders of the four sub-domains, also has a representation of students (one from the first and one from the second year), one representative of the AAP (teaching and research assistant), one alumnus and one representative of the ATP (administrative and technical staff). This Educational Board will, among other things, monitor the quality of the programme. Two instruments play a crucial part: the teaching e-valuation by students and a survey of alumni. The teaching e-valuation takes place at the end of every semester and is aimed at evaluating all courses and lecturers. The alumni surveys are organised centrally by the VUB. Obviously, given the very small number of students, the data from these **surveys** often do not have much statistical relevance. The assessment panel is therefore satisfied with the SER's announcement of two-monthly meetings of the scientific-administrative coordinator with the students. Not all recommendations of the previous (2006) assessment have been followed-up. Since the last assessment the programme has already changed twice: in 2007–2008 (when it became a master's programme) and in 2012–13 (when the English programme was revamped, 'to solve the organisational problems encountered in the previous programme and to expand the practical trainings to all course units offered'). It is regrettable that, despite these efforts, the programme management did not manage to tackle the low student intake. Also, the

panel finds that the attitude to quality assurance could be more active. There is a need for a commonly shared **vision and quality** assurance about what direction this programme should take in the future. The panel recommends the programme management to strengthen the internal quality assurance culture and work towards a realistic plan for the future with clear objectives in the short and medium term.

The panel concludes that there are sufficient quality guarantees concerning the learning process. The learning outcomes are adequately reflected in the programme. Courses are built on ongoing research and the research expertise of the staff is quite high. Concern is the low intake and the need for strengthening a clear and commonly shared vision and quality assurance of the programme towards the future. The panel recommends to focus on active promotion of the master and on the development of a realistic plan for the future. .

Generic quality standard 3 - Outcome Level Achieved

The assessment panel evaluates the outcome level achieved for the Master of Science in Biomolecular Sciences as satisfactory

The evaluation policy of the programme consists, according to the SER, of a strong emphasis on **reliability** and validity. Various **types of evaluation** are used. In the first year the most common evaluation form is oral examination with written preparation, although for some courses oral examination or written examination with open or closed questions are also used. Since every course in the first year consists of a theoretical and a practical part, practicals are also evaluated. This is mostly based on written reports or assignments, sometimes in combination with observation of the students during the practical training sessions. During the oral examinations questions about the practicals can also be asked. In the second year, the oral examination form predominates, although oral evaluation with written preparation is still used. For the self-studies, evaluation of written assignments is often used.

Evaluations among students show that they appreciate the organisation of the exams and the structure of exam schedules, but would prefer the exam timetables to be communicated earlier (although students themselves determine their examination schedule). The reliability of evaluations is increased when multiple examiners are involved in the final marking – for example for the courses of the first year, where both theoretical knowledge and practical skills are evaluated by different people. Oral

examinations are new to many students, but much appreciated. According to the SER, students 'easily adapt to the examination system'. This is the main reason why introducing interim tests – a recommendation from the previous assessment – has not been followed up. The current panel has viewed a selection of **exam questions** and finds these satisfactory. Overall, the quality of evaluation and the combination of different forms of examination give results that reliably reflect the level achieved.

The **master's thesis** (30 ECTS) is submitted to the jury three weeks before the date of the public defence. One week before the public defence, a 'mock defence' is organised and participation by all students is compulsory. The jury for the public defence is composed of the promoter(s), copromoter(s), supervisor(s) and two external jury members or 'readers' and two permanent jury members (one of whom is the scientific-administrative coordinator). The two readers and the two permanent jury members independently give a score. The promoter and the two readers also independently mark the research paper and the PhD proposal written in the context of the course 'Research communication and management'. The assessment panel has read a sample of 10 recently written master's theses. Their quality is high, and consistent with the grades awarded. According to an alumni survey, transparency and explanation of the grade awarded for the master's thesis could be better. In an interview with the assessment panel, the students confirmed that they are not aware of the evaluation criteria. The SER admits that communication about these issues should be improved in the future. The panel considers it necessary to create an assessment form in the short term with a clear link to the learning outcomes.

Overall, the panel finds that the **learning outcome targets** are **achieved**. The high quality of the master's theses and the high percentage of students enrolling in a PhD *(see below)* are obvious indicators of success. A majority of alumni (about 73%) declared in a questionnaire that the objectives of the programme had been reached (the remaining 27% were 'neutral'). The alumni that have been interviewed by the assessment panel were quite satisfied with the programme.

According to the SER, graduates are **employable** in different types of jobs such as the medical, pharmaceutical and biotechnological industries, both in research, production and quality control functions; academic research laboratories; hospital and medical labs; science education and training; Research and Development departments of academic institutions and industries; management; science journalism; patent law offices; and

governmental organisations. From the alumni survey it is learned that, after graduation, half of the respondents started PhD studies. This is an excellent result, and perfectly in line with the programme's ambition as expressed in the learning outcomes. Nevertheless, communication by the programme regarding future career possibilities is a weak point. The alumni survey pointed out that most graduates consider they were not adequately informed by the programme about professional opportunities (25% answered 'neutral', 33% 'no' and 25% 'definitely no'). Students have confirmed this during the site visit to the assessment panel. In particular, they lack adequate information on starting a PhD.

Of the 25 students that have enrolled in the programme, 22 obtained their diploma: 19 students after two years and the remaining 3 after 2.5 years. The average **study yield** is 90.8%. Over the years there has been a slight decrease in study yield, because of the tendency to defend the master's thesis in January of the third year. Even so, the pass rate remains quite high.

Regarding the English-language variant, the panel finds that the learning outcomes are achieved. The high quality of master's theses and the high percentage of students enrolling in a PhD can be outlined. Various types of evaluation are used. The panel considers it necessary to create an assessment form in the short term with a clear link to the learning outcomes. The panel concludes that there are sufficient generic quality assurances regarding the final attainment level of the English-language variant. Regarding the Dutch variant, the panel notes that to date no single student has enrolled in this programme. Given this fact there is no data about student progression rates and achieved learning outcomes. However, the panel is convinced that because of the equivalence with the English variant, all guarantees required for quality, validity, reliability and transparency of assessments, testing and examination are in place.

Final judgement of the assessment panel

Generic quality standard 1 – Targeted Outcome Level	S
Generic quality standard 2 – Learning Process	S
Generic quality standard 3 – Outcome Level Achieved	S

As Generic quality standard 1 is evaluated as satisfactory, Generic quality standard 2 is evaluated as satisfactory and Generic quality standard 3 is evaluated as satisfactory, the final judgement of the assessment panel about the Master of Science Biomolecular Sciences (for both variants) is satisfactory, according to the decision rules.

Summary of the recommendations for further improvement of the study programme

Generic quality standard 1 – Targeted Outcome Level

- Reflect the rationale of the programme in the learning outcomes.
- Involve international experts to reconsider the vision and focus of the programme in the light of, for instance, non-communicable diseases.
- Improve the visibility of the programme.

Generic quality standard 2 – Learning Process

- Diversify teaching methods to challenge students, for instance by further developing e-learning possibilities.
- Strengthen the relationship between theory and practice in order to enhance the learning effect for students.
- Initiate more in-depth elective courses sourcing other faculties of VUB.
- Adopt a proactive approach to the detection of professional development needs and the provision and/or facilitation of a focused professional offering, primarily around interactive teaching for small groups.
- Develop a team-oriented professional development policy starting from the needs of the programme.
- Radically change the approach to online publicity and communication to possible students and partner-institutions
- Strengthen the policymaking capacity and make serious progress on a recruitment plan so as to increase the intake to an acceptable level
- Guarantee access to textbooks for the students.
- Strengthen the internal quality assurance culture and work towards a realistic plan for the future with clear objectives in the short and medium term.

Generic quality standard 3 – Outcome Level Achieved

- Explain the criteria and weighting for the master's thesis, and introduce a standardised thesis evaluation form.
- Improve information about future careers, including information on applying for PhD training.

"The assessment panel wishes to express its appreciation for the initiatives that already are and will be taken to implement its suggestions. These include – based on the reflections during the first feedback round – several actions to increase the visibility of the programme and increase the number of students, more extensive national and international benchmarking, training of staff in teaching methods designed for a small audience, improvement of the access to textbooks, the use of a standardized evaluation form for the evaluation of the master's thesis, improvement of information about future careers."

VRIJE UNIVERSITEIT BRUSSEL, KU LEUVEN & UNIVERSITEIT ANTWERPEN
Master of Science in Molecular Biology

SUMMARY
Master of Science in Molecular Biology
Vrije Universiteit Brussel, KU Leuven and Universiteit Antwerpen

From 28–29 April 2014, the Master of Science in Molecular Biology jointly organised by the Vrije Universiteit Brussel (VUB), Universiteit Antwerpen (UAntwerpen) en KU Leuven, has been evaluated in the framework of an educational assessment by a peer review panel of independent experts. In this summary which describes a snapshot, the main findings of the panel are listed.

Profile of the programme

The programme aims to strengthen and update the theoretical and practical skills of young scientists from developing countries who are already involved in either human or animal health care, or agricultural research. The goal of the programme is not just to transfer technology but rather to train participants to acquire the ability to cope with a wide range of scientific problems and challenges and to provide them with the intellectual tools needed to develop a molecular biological approach to tackle the problems their country is facing.

Although originally designed to meet the needs of students from developing countries, the programme offers an excellent opportunity for those who seek re-orientation to enter the world of molecular biology. After two years of study, graduates should be able to disseminate their knowledge and

skills at home and they should be aware of ethical issues that are related to this field.

Programme

The programme counts 120 ECTS and consists of two years. In the first year, all students register at VUB and all lectures and some of the practicals take place at the VUB campus. In the second year, students of the Animal Production and Plant Production profiles register at KU Leuven, while students of the Human Health profile register at VUB. All common courses take place at the VUB campus, as well as the courses of the Human Health profile. In the first year 57 of the 60 ECTS are compulsory.

In the second year, all students follow four common core courses, taught during the first semester. In the second semester, the students follow the specialised courses of the Human Health, Animal Production, or Plant Production profile. Each profile consists of 3 courses, together worth 12 ECTS, plus a master's thesis of 30 ECTS. The choice of profile is already determined before the start of the programme, based on the students' previous (bachelor) studies and envisaged career development. However it is still possible to change during the first year.

While in the first year knowledge acquired mainly originates from lectures based on text books, in the second year research papers are an important source of information. Especially in the second year, students are supposed to also acquire new knowledge during private study (i.e. reading prescribed chapters in books and research papers related to the course contents). The use of film is becoming more and more common in many classes to illustrate certain aspects of the lectures more effectively.

Evaluation and testing

In the first year the most common evaluation form is oral examination with written preparation. Oral examination without written preparation is scarcely used, and only in the second year. Another evaluation form commonly used is the written examination with either open or closed questions, or a combination of the two.

In the second year, self-study assignments are presented and discussed during the oral (or occasionally written) examination. For the evaluation of the practicals, multiple evaluation forms are used, both formative and summative. Another evaluation form used in this context (mainly during

mock defences) is peer assessment. The master's thesis has to be defended in public before a jury.

Services and student guidance

All newcomers are welcomed at the start of the academic year. A meeting is organised at which they receive information on the structure and content, historical background and objectives of the programme. During their studies, the students can always rely on the lecturers whenever they meet problems with course content. Contacts between lecturers and students are open.

At university level the Study Guidance Center or SGC, located on the VUB campus, offers study guidance to all students.

In the first year, the practicals take place at the VUB campus or in specific research labs. All labs are well equipped. In the second year, lectures take place at the VUB or at KU Leuven, depending on the profile that has been chosen. The two universities are at a relatively short distance from each other. To make it easier for the students, profile courses are grouped together in a single day. All students have free access to the libraries of the organising universities.

Study success and professional opportunities

In the period from 2006–07 to 2011–12, about 95% of the students finished the programme after two years. The study yield is slightly higher at KU Leuven (where only students of the second year register) than at VUB. This is mainly due to trajectory starters, who all have to register at VUB. In recent years a decrease in study yield has been reported, at KU Leuven as well as at VUB. This is mainly due to the fact that some students postpone the defence of their master's thesis till January of the next year.

Within the group of non-scholarship students a remarkably lower number of students graduate in time. Students without a scholarship perform in general less well because they often have to work to pay for their studies, accommodation and living costs. Among all students, but especially those without a scholarship, there is a tendency to spread their studies over longer periods of time.

Graduates are in high demand on the job market. Three sectors are major employers: public service/government, education and training and the

medical/health care sector. Some of the graduates are active as advisors to policy makers on issues related to science in general and molecular biology/biotechnology in particular. Remarkably, hardly any of the graduates end up in industry. Graduates either go into the job market or continue their studies.

ASSESSMENT REPORT
Master of Science in Molecular Biology
Vrije Universiteit Brussel, KU Leuven and Universiteit Antwerpen

Preface

This report concerns the Master of Science in Molecular Biology, jointly organised by the Vrije Universiteit Brussel (VUB), Universiteit Antwerpen (UA) and Katholieke Universiteit Leuven (KU Leuven). The assessment panel visited the study programme during its visit to the VUB, from 28 to 29 April 2014.

The panel assesses the study programme on the basis of the three generic quality standards (GQSs) of the VLUHR programme assessment framework. This framework is designed to fulfil the accreditation requirements set by the NVAO. For each generic quality standard, the panel gives a weighted and motivated judgement on a four -point scale: unsatisfactory, satisfactory, good or excellent. In the assessment of generic quality assurance, the concept of 'generic quality' indicates that the GQS is in place and that the programme – or a specific mode of the programme – meets the quality level that can reasonably be expected, from an international perspective, of a Master's programme in higher education. The score 'satisfactory' indicates that the programme meets the generic quality because it demonstrates an acceptable level for the particular GQS. If the study programme scores 'good', the programme systematically exceeds the generic quality for that standard. If the programme scores 'excellent', it achieves well above the generic quality for the particular GQS and serves as an (inter)national example. The score 'unsatisfactory' indicates that the programme does not attain the generic quality for that particular GQS.

The panel's opinions are supported by facts and analyses. The panel makes clear how it has reached its opinion. The panel also expresses a final opinion on the quality of the programme as a whole, also according to the same four-point scale. Judgements and recommendations relate to the programme with all subordinate modes or majors, unless stated differently.

The panel assesses the quality of the programme as it has been established at the time of the site visit. The panel has based its judgement on the self-evaluation report and the information that arose from the interviews with the programme management, lecturers, students, alumni and personnel responsible at programme level for internal quality assurance,

internationalisation, study guidance and student tutoring. The panel has also examined the course materials, master's theses, test and evaluation assignments and standard answering formats, and numerous relevant reports available. For the student success rate, the panel relied on the data provided by DHO as well as data provided by the programme management. The panel has also visited the educational specific facilities such as classrooms, laboratories and libraries during the site visit to the VUB.

In addition to its judgement, the panel also formulates recommendations with respect to quality improvement. In this manner, the panel wants to help improve the quality of the programme. The recommendations are included in the relevant sections of the respective generic quality standards. At the end of the report an overview is given of improvement suggestions.

Context of the study programme

The Master of Science in Molecular Biology consists of 120 ECTS credits, spread over two years. The programme has 69 students enrolled (2011–2012). The programme is embedded in the department of Applied Biological Sciences of the Faculty of Science and Bio-engineering Sciences of the VUB, the Faculty of Bioscience Engineering of KU Leuven, and the Faculty of Medicine of the UA. Since its launch in the academic year 1996–1997 it has been an International Course Programme supported by VLILR-UOS. Being an ICP, the programme focuses on topics that are developmentally relevant and focuses on training of participants from Africa, Asia and Latin America.

The Interuniversity Programme Molecular Biology (IPMB) was launched in the academic year 1996–1997. From the beginning, it was jointly organised by the VUB, KU Leuven and the UA. Since its start, no major changes have been made in the structure of the programme, except for the updating of course contents. All students register at VUB, though some students in the second year (depending on the profile that is followed) have to register at KU Leuven.

The programme is managed by the Educational Board, consisting of the members of the formal steering committee plus representatives of the students (two from the first and three from the second Master, i.e. one from each Profile), one AAP, one alumnus and one representative of the ATP. The Educational Board is an advisory board to the board of the Department of

Bio-engineering Sciences of the VUB and discusses the following matters: changes in the programme; the identification of course leaders (the latter being ZAP members of the organizing universities) and lecturers who may assist the course leaders for the courses in their educational tasks; the content, form, consistency and feasibility of the study programme; quality monitoring and quality improvement of the study programme; and preparations for assessment visits.

Generic quality standard 1 - Targeted Outcome Level

The assessment panel evaluates the targeted outcome level as satisfactory

The programme aims to strengthen and update the theoretical and practical skills of young scientists from developing countries who are already involved in either human or animal health care, or agricultural research. The goal of the programme is not just to transfer technology but rather to train participants to acquire the ability to cope with a wide range of scientific problems and challenges and to provide them with the intellectual tools needed to develop a molecular biological approach to tackle the problems their country is facing. Although originally designed to meet the needs of students from developing countries, the programme offers an excellent opportunity for those who seek re-orientation to enter the world of molecular biology. After two years of study, graduates should have developed a sound basis to cope with the development of preventive strategies, diagnostic techniques and therapies and with the development of methods that contribute to improving **animal and crop production**, based on a **molecular biological approach**. They should be able to disseminate their knowledge and skills at home and they should be aware of ethical issues that are related to this field.

This overall objective has been translated into **12 domain-specific learning outcomes**. Because the structure of the programme has not been basically changed since the previous assessment, the learning outcomes have been derived, regrouped and updated from those previously defined. In addition, new learning outcomes have been introduced, on the use of ICT, awareness of ethical aspects on research and publication, functioning in a multi-disciplinary team, ability to contribute to solving problems faced by developing countries, and the ability to appraise scientific and social aspects of applied molecular biology.

According the SER, the Master of Science in Molecular Biology is a **unique study programme** in Flanders. Consequently, the learning outcomes that were defined for the programme coincide with the domain-specific learning outcomes. With its emphasis on fundamental research, the targeted level is quite high. The programme learning outcomes comply with the Flemish qualification framework and – evidently – with the domain-specific learning outcomes. Because of the specific relevance to students from the South, VLIR-UOS supports the programme as one of its **International Course Programmes**. As stated above, there is a strong focus on capacity -building in the South. Three of the twelve learning outcomes directly refer to this: graduates have to be able to (i) contribute to solving problems faced by developing countries, (ii) contribute to setting up nationwide and international cooperation and (iii) be able to disseminate acquired knowledge in the country and region of origin.

As defined in the programme-specific learning outcomes, the programme focuses on human health, animal production or plant production. These are the three profiles the students have to choose between. The choice of profiles is a relevant one, according to the panel. However, regarding animal and plant production, the panel would suggest the use of the terms animal and plant science (production is only one aspect, implying only research that results in short -term applications). The panel also recommends the inclusion of a reference to animal and plant health. The panel agrees with the focus on infectious diseases, but considers it necessary to pay adequate attention to non-communicable diseases, a more important health threat.

According to a survey among alumni, about 80% were **familiar with the programme objectives** at the start of the programme. The remaining 20% responded that the objectives became clear to them in the course of the programme. According to the SER, the programme is not only unique in Flanders 'but most probably worldwide', due to its focus on developing countries. The panel, however, regrets the limited scope of **international benchmarking**, comparison with other programmes and reflection by international experts on the learning outcomes to prove it. This makes it harder for stakeholders (future students, the working field, etc.) to judge the level of the programme. The panel strongly advises the implementation of a periodic more extensive benchmark of the programme and the programme-specific learning outcomes. Such a benchmark is an instrument that offers external input to keep the programme-specific learning outcomes in line with the expectations of (future) students, the professional field and governments, organisations and societies in the

South. In this context, the panel recommends increasing and formalising the involvement of the professional field, such as institutions in the South, partners of CGIAR, etc.

In conclusion, the panel finds that the programme learning outcomes comply with all formal requirements. There is an emphasis on fundamental research and the targeted level is high. The limited scope of international benchmarking makes it harder for stakeholders (future students, the working field, etc.) to judge the level of the programme. The panel strongly advises the implementation of a periodic benchmark of the programme and the programme-specific learning outcomes.

Generic quality standard 2 - Learning Process

The assessment panel evaluates the learning process as good

The master of Molecular Biology, 120 ECTS, consists of two years.

In the first year, all students register at VUB and all lectures and some of the practicals take place at the VUB campus. In the second year, students of the Animal Production and Plant Production profiles register at KU Leuven, while students of the Human Health profile register at VUB. All common courses take place at the VUB campus, as well as the courses of the Human Health profile. In the **first year** 57 of the 60 ECTS are compulsory. The courses provide the students with a sound and in-depth knowledge of a variety of disciplines in the life sciences, such as Molecular biology, General chemistry, Biochemistry, Protein chemistry, Microbiology, Virology, Immunology, Parasitology, Physiology, Genetics (of both higher and lower organisms), Mathematics and statistics, and Bioinformatic tools. Some of these courses, or parts of them, support other courses in the first and second year.

In its SER the programme emphasises that 'most incoming students hardly got any practical training at all' in their previous studies. Therefore, in the first year of the programme, two types of **practical** are organised: general practicals at the end of the first semester after lecturing has come to an end (organised at VUB), and specialised practicals (organised in small groups in different research laboratories). This training in research labs confronts the students with the reality of scientific research and contributes to the development of research attitudes. It is of particular importance to prepare them for their experimental work during the master's thesis. According to

an alumni survey and student evaluations, the quality and supervision of the training are considered quite good. This view was confirmed during the site visit of the assessment panel. The panel itself is impressed by the practicals as they form a basic element for success.

In the **second year**, all students follow four common core courses (Advanced and applied molecular biology, Advanced microbial genetics and virology, Physical chemistry and structural analysis of macromolecules, Social and economic aspects of biotechnology). These common courses, together worth 18 ECTS, are taught during the first semester. In the second semester, the students follow the specialised courses of the Human Health, Animal Production, or Plant Production profile. Each profile consists of 3 courses, together worth 12 ECTS, plus a master's thesis of 30 ECTS. The **choice of profile** is already determined before the start of the programme, based on the students' previous (bachelor) studies and envisaged career development. However it is still possible to change during the first year.

The curriculum is coherent and allows students to achieve the learning outcome targets. However, more flexibility would be an added value. While not being in favour of more flexibility itself, the SER admits that 'depending on the level attained during their previous Bachelor training, some courses might be considered by some students at first glance as superfluous'. The programme argues that the heterogeneity and different background of the students make more flexibility impossible. However, if one takes the students' views into account, there seems to be a real need for a more **tailored and flexible** curriculum. According to a survey among alumni from 2006–07 to 2011–12, about 64% did not consider the flexibility (or lack of it) as a negative point, but 18% were 'neutral' and another 18% wished there had been more possibilities for flexible learning. The assessment panel learned from the students that they strongly desire more electives (not only more credits but also a larger number to choose from) and fewer common courses. They already have specific interests and ambitions and want to follow courses that are more in line with their master's thesis topic. This opinion was also heard (although some ex-students warned against endangering the breadth of the programme). Based on these findings, the panel recommends that the programme management should consider the introduction of one or more individual study paths.

While in the first year knowledge acquired mainly originates from lectures based on text books, in the second year research papers are an important source of information. Especially in the second year, students

are supposed to also acquire new knowledge during private study (i.e. reading prescribed chapters in books and research papers related to the course contents). The use of film is becoming more and more common in many classes to illustrate certain aspects of the lectures more effectively. Computer-based learning is not commonly used as a work form. The e-learning platform PointCarré is operational but mainly used to post lecture notes, Powerpoints, etc. Students perceive that **the teaching methods** are fundamentally different in the first and the second year. For students coming from a different educational culture, the first year feels too passive and lecture-based. They emphasise that second -year classes are much more interactive, with room for discussion. The panel recommends the implementation of more activating teaching methods and the use of the opportunities of the e-learning platform to deal with the diversity of competences of the students. In this context, the panel considers it necessary to strengthen the educational professionalisation of the (senior) academic staff.

For the **master's thesis** a list of proposals is distributed. Students can also choose a topic of their own, 'as long as it contributes to the knowledge of the field concerned', and as long as it fits with the ongoing research lines of the labs concerned. Some students complain that their favourite research topic cannot be used. In this respect, the panel notes that many thesis subjects are not directly related to the home countries of the students, but refer to 'Belgian' situations. The panel finds this noteworthy because the learning outcomes explicitly focus on capacity-building in the South. The panel therefore recommends to the programme management to investigate the possibilities of more thesis topics that are indirectly or directly relevant to the South. Enhanced cooperation with the professional field is an important precondition for this. Students start the **experimental work** for their thesis in the first semester of the second year. For the lab work they are guided by supervisors, sometimes IPMB alumni. During this period, students have to report on the experiments performed and the results obtained and suggest and discuss future experiments. At the beginning of May in the second year, all students have to submit a first draft of the literature survey of their thesis. The assessment panel strongly argues that this is too late, and should ultimately be done around January. The panel therefore advises the programme management to pay more attention to the development of competences related to project management. Towards the end of May, the students present their introduction orally in a PowerPoint presentation in front of their classmates. Fellow students are encouraged to ask questions and make suggestions for improvement.

Based on an alumni survey and student evaluations, it turns out that the quality of guidance and supervision of the master's thesis are quite good.

All **course leaders** are senior academic staff members (ZAP) of the organising universities, recruited according to the procedures that govern staff management of the institutes they belong to. In several courses, some of the teaching is done by ZAP or special research assistants (BAP) from collaborating universities or institutions. For many courses, there is more than one lecturer: the additional lecturers are either staff members of the organising universities, or co-workers from non-organising universities and research institutes. As for the **assisting staff**, the programme can rely on one full-time assistant who takes care of (among other things) the practicals. All other teaching and research assistants (often alumni of the programme) are to some extent involved in practical trainings and thesis preparations. Lecturers are easy approachable as well as very motivated, and students are generally satisfied with their teaching. The combination of lecturers from multiple universities is evidently an asset. In a survey among alumni, the majority agreed that the staff members are **real experts** in the topics they are teaching. The assessment panel confirms that the staff corps is highly qualified. It is emphasised in the SER that new lecturers are 'thoroughly informed about the aims' of the programme, 'so that they exactly know the context in which they will operate'. The focus on development is strengthened by the fact that many lecturers are promoters of projects in countries where students are coming from, and as such they have knowledge of the needs of these countries. At the moment of the assessment 32 ZAP members were involved in the programme, as well as 57 'co-workers' (AAP, BAP, PhD students, etc.). In the coming years quite a few ZAP staff members will have to be replaced, although this is no threat according to the SER since none of the staff members is solely affiliated to this programme. Also according to the SER, the growing number of students is putting 'a high pressure' on the staff, who have coped with this pressure so far 'because of their enthusiastic attitude'. The panel greatly values this engagement, but nonetheless considers the current **student-staff ratio** to be adequate. However, a sharp increase in students (i.e. significantly above 40) might call for a reorganisation of the practical training and increased pressure on academic and administrative/technical staff. Until 2012, special training for starting lecturers was organised at VUB. In 2013, the educational seminar was replaced by a comprehensive, 90 -hour path for teachers' professional development. This outstanding initiative will be compulsory from 2014–2015 onwards for all new ZAP members. Similar 'professionalisation' sessions for academic staff members are organised

at KU Leuven and UA. In spite of the ongoing professionalisation, the panel finds that the **didactic quality** is not at its highest level yet. The staff needs more insight into the variety of approaches to teaching methods, in particular with regard to e-learning and use of PointCarré. As has been remarked, most lecturers do not use PointCarré as an interactive tool to support the learning process.

The **intake criteria** for non-scholarship students are straightforward. Holders of a bachelor's degree (in various related disciplines) from a Flemish university have direct access to the programme. For all other applicants, admission can be granted after consideration of an application file by the steering committee. For students outside the EEA, proof of English proficiency is compulsory. For the selection of the **VLIR-UOS scholarships**, different criteria are imposed, related to (among other things) study results or future prospects. Another criterion is the presence of IPMB alumni in the institution of origin so that the 'critical mass' of IPMB alumni can gradually be built up. Care is taken to ensure that the scholarship holders are fairly distributed among the three profiles in the second year. Special attention is also given to gender equality. Interestingly, many scholarship students already had a job before the start of their studies. Most scholarships go to students from Ethiopia, Kenya and Tanzania, and in more recent years also from Uganda. With regard to Asia, Vietnam, the Philippines and Bangladesh are the most strongly represented. Based on the study yield for holders of scholarships *(see GQS 3)*, the intake criteria seem adequate. The programme is witnessing a **positive trend in enrolment**. Especially since the academic year 2010–11 there has been a considerable increase, in spite of the fact that the number of scholarships has remained constant. In recent years, students have also been using other types of scholarships more frequently, such as BTC, Erasmus Mundus or scholarships issued by their government. According to the SER, an increasing number of students are also relying on their own financial resources to cover the costs of their studies, and it is mainly the Human health profile that is attracting self-supporting students.

While the number of scholarship students remains more or less the same, the programme has seen a sharp increase in the number of **non-scholarship students**. In theory the admittance of these students increases the development relevance of the programme. It is necessary to have a transparent intake policy regarding this group, in which value for their country and potential in terms of capacity -building should be major criteria.

All newcomers are welcomed at the start of the academic year. A meeting is organised at which they receive information on the structure and content, historical background and objectives of the programme. During their studies, the students can always rely on the lecturers whenever they meet problems with course content. Contacts between lecturers and students are open, and students appreciate this very much. At university level the **Study Guidance Center** or SGC, located on the VUB campus, offers study guidance to all students. From the academic year 2013–14 onwards, the programme management have been working in closer collaboration with the SGC, including mandatory participation of first -year students in the study seminars on study skills and examination skills.

Clearly the programme is very aware of potential **adaptation and integration** problems of foreign students. As the SER states, everything is done 'to make students feel at home immediately'. While talking to the assessment panel, students have called this 'very welcoming feel' a reality. Unfortunately organisation of housing seems to be a problem. Nearly all students, except those with a scholarship, experience difficulties in finding appropriate and affordable accommodation. While this is not a direct study-related topic, the programme managers should be aware of these concerns. The overall organisation of the programme seems to run smoothly, although students get annoyed by regular last-minute cancellations of classes. Communication – or lack thereof – is seen as one the major flaws of this programme.

At both VUB and KU Leuven an **ombudsperson** is available to the students. The SER emphasises that complaints hardly occur. Obstacles are mostly discussed and solved by the scientific-administrative coordinator and his assistant. The panel has also learned about the highly qualified support provided by the IPMB secretariat.

Interviewed by the panel, students described the programme – and especially the first semester of the first year – as quite intensive. The SER confirms that this programme is **'extremely demanding'** and that students have to be fully committed if they want to be successful. In a survey among alumni from 2006–07 to 2011–12, 66% called the study load 'heavy' and 20% even 'too heavy'. In the annual VUB electronic teaching e-valuation *(see infra)*, the time is measured that students spend studying particular courses. Here also the study load is felt to be higher than expected. Interestingly, an analysis has been made of potential 'pitfall courses' (courses that can be considered as true hurdles) and it turned out

that no such courses can be identified. According to the IPMB programme, the **perceived study load** is 'due in part to the very different background of the students, to the very tight time tables and to the fact that teaching is done at higher speed than what students were used to at home'. Students told the assessment panel that the lab work is quite time-consuming, and that they do not like the combination of classes and thesis experiments. This has been already amply discussed at programme level – including a suggestion to cluster all second-year courses in the first semester – but from an organisational point of view it remains difficult. In this respect, the panel repeats its recommendation that students should submit the literature survey of the master's thesis much earlier.

The **infrastructure** and **day-to-day management** are adequate. In the first year, the practicals take place at the VUB campus or in specific research labs. All labs are well equipped. In the second year, lectures take place at the VUB or at KU Leuven, depending on the profile that has been chosen. The two universities are at a relatively short distance from each other. To make it easier for the students, profile courses are grouped together in a single day. All students have free access to the libraries of the organising universities. Students can also borrow books from a special IPMB library at the VUB.

Students and alumni have a representation on the Educational Board. This board serves as an advisory body to the Steering Committee, and deals with (among other things) quality monitoring and quality improvement. A survey among alumni shows that a majority is satisfied with the opportunities they had to be heard by the programme management while they were students. The current student representatives told the assessment panel that their voice is certainly heard when needed. Oddly enough, the programme management itself has been less satisfied with the **student representation**, claiming that they 'mostly talked on their own behalf and not on that of the group they represented'. Therefore the students' representatives will be asked to organise bi-monthly meetings with their fellow students and submit a short report to the scientific-administrative coordinator, to be discussed at the meetings of the Educational Board. This board's members include two students of the first year and one student from each profile in the second year, as well as one alumnus residing in Belgium. Another way of taking the **student's voice** into account is the teaching e-valuation and the alumni survey. The teaching e-valuation takes place at the end of every semester and covers all courses and lecturers. Students enrolled at both VUB and KU Leuven

participate in this survey, but for the profile courses organised in Leuven there are other (biannual) surveys. The alumni survey organised centrally by VUB was based on an alumni list compiled by the secretariat of IPMB and consisted of all alumni from whom email addresses were available. Apart from these centrally organised surveys, the programme management also organises its own student survey after the first and the second master. Overall, it is clear that the programme pays a lot of attention to the results of these surveys and takes any necessary steps. The SER written on the occasion of the assessment makes ample use of survey results. The panel praises the quality of this report.

To increase the involvement of alumni – a recommendation of the previous assessment – an IPMB-Gazette has been established, an electronic forum that will keep alumni informed about the programme (and vice versa). The programme management admits that involving the vocational field is still 'hard to achieve'. Not all **recommendations** of the previous assessment (in 2006) have been followed up, but the programme management has generally provided a reasonable justification when this is not the case (besides, the result of the 2006 assessment was already quite good).

The panel concludes that the programme management has created a cohesive learning environment. There is intense interaction between the key stakeholders (lecturers, students and support staff). The panel therefore concludes that there is an effective internal quality assurance system. The expertise, dedication and enthusiasm of the lecturers and support staff concerned is of crucial importance. Despite this, the panel wishes to recommend that the programme management should consider how more flexibility can be built into the programme. Finally, the programme management should work to ensure a closer relevance between thesis topics and current issues and research topics from the South, so that the objective of the programme is also apparent in the master's theses.

Generic quality standard 3 - Outcome Level Achieved

The assessment panel evaluates the outcome level achieved as satisfactory

The evaluation policy of the programme consists, according to the SER, of a strong emphasis on **reliability** and **validity**. These principles seem to be respected, except in the case (as will be outlined below) of the master's thesis. During the welcome meeting at the beginning of the year (supra),

the examination regulations are explained in detail. Moreover, each course leader informs the students during the first lecture about the examination forms that will be used, and how the final mark is determined.

Various **types of evaluation** are used. In the first year the most common evaluation form is oral examination with written preparation. According to the SER, most lecturers believe that this form of examination is optimal, especially in view of the rather limited group of students. Oral examination without written preparation is scarcely used, and only in the second year. Another evaluation form commonly used is the written examination with either open or closed questions, or a combination of the two. In the second year, self-study assignments are presented and discussed during the oral (or occasionally written) examination. This makes it possible to test a student's ability to critically read scientific literature and to place it in a broader context.For the evaluation of the **practicals**, multiple evaluation forms are used, both formative and summative. They aim to assess practical skills, report writing, oral presentation, and the attitude (punctuality, discipline, ways of communication) of students and their functioning as members of a team. Another evaluation form used in this context (mainly during mock defences) is peer assessment, which is a means of training students' skills such as evaluating and building a well-founded argumentation and judgement. Feedback given by students to their colleagues should be meaningful to the recipient and contribute to improvement.

The panel has viewed a selection of exam questions and finds their quality satisfactory, focused on assessing knowledge and insight. Standard answering formats are sometimes used, but not (yet) overall. Due to the limited number of students, the chosen intensive form of examination is feasible. Oral examinations appear to be a challenge for a lot of students – as it is not part of their education culture – but they are sufficiently prepared and informed about the approach in such examinations. A lot of students even appreciate oral examinations afterwards. After each examination session, all students have a short interview with the scientific-administrative coordinator to discuss their study progress. In spite of this, the panel finds **feedback** on evaluation somewhat lacking.

The **master's thesis** (30 ECTS) is submitted to the jury three weeks before the date of the public defence. One week before the public defence, a 'mock defence' is organised and participation by all students is compulsory. The jury for the public defence is composed of the promoter(s), copromoter(s),

supervisor(s) and two external jury members or 'readers', the latter being PhD holders that are acquainted with the topic but did not contribute to the thesis. After the defence, the jury members mark the thesis independently. The final mark is the mean of these marks. The assessment panel has read a sample of 12 recently written master's theses. According to the panel, the quality of these master's theses is quite good and consistent with the awarded grades, but there are no clear **criteria** outlining how the final grade is made. The SER itself admits that more attention should be paid to explaining the assessment criteria and grades awarded. Interestingly, KU Leuven uses a standardised evaluation form for promoters and readers. The obvious question therefore is why VUB has not adopted this form. The panel considers it necessary to create an assessment form in the short term with a clear link to the learning outcomes.

The SER stresses that graduates are in high demand on the **job market**. Three sectors are major employers: public service/government, education and training and the medical/health care sector. Some of the graduates are active as advisors to policy makers on issues related to science in general and molecular biology/biotechnology in particular. Remarkably, hardly any of the graduates end up in industry. Graduates either go into the job market or continue their studies. According to the SER, most students have the ambition to start a PhD. Alumni surveys point out that the proportion of students employed in education and training has increased remarkably. These graduates are best placed to disseminate their acquired knowledge and skills at home and, as such, generate an important multiplicator effect.

According to surveys among alumni, the employed graduates are in general **(very) satisfied with their current job**. Most alumni feel that their current position is consistent with their university education, and that their degree was a prerequisite, or at least an extremely important factor, for obtaining the position they hold. There is a general agreement amongst the alumni that their education prepared them adequately for their current position. Most of them also believe that they were properly informed about the professional opportunities offered by their studies.

In the period from 2006–07 to 2011–12, about 95% of the students finished the programme after two years. According to the SER, the **study yield** is slightly higher at KU Leuven (where only students of the second year register) than at VUB. This is mainly due to trajectory starters, who all have to register at VUB. In recent years a decrease in study yield has been reported, at KU Leuven as well as at VUB. According to the SER, in

both cases this is mainly due to the fact that some students postpone the defence of their master's thesis till January of the next year.

Within the group of non-scholarship students a remarkably lower number of students graduate in time. According to the SER, students without a scholarship perform in general less well because they often have to work to pay for their studies, accommodation and living costs. Among all students, but especially those without a scholarship, there is a tendency to spread their studies over longer periods of time.

Overall, the panel finds that the learning outcome targets are achieved. Nearly all alumni who responded to a questionnaire stated that the objectives of the programme had been reached. The quality of the master's theses and the high number of students enrolling in a PhD are indicators of success. Significantly, however, most PhDs are completed in Belgium, other European countries, USA or Canada. It is not so clear to what extent **capacity-building** is achieved, in other words how many alumni eventually return home and will contribute to the development of their country. The programme management is aware of this problem and has conducted an extensive survey of alumni. The panel was able to see the results of this survey, and wishes to commend the management on this detailed and valuable research. The panel recommends that such a survey should be conducted periodically so that reliable data is collected on the employment of alumni in their home country, in support of policy.

In conclusion, the panel is satisfied with the variation in evaluation, although adequate feedback is somewhat lacking. The master's thesis is generally of good quality, but clear evaluation criteria are lacking. Graduates are in high demand on the job market and many obtain a PhD. The diploma yield of non-scholarship students should be monitored.

Final judgement of the assessment panel

Generic quality standard 1 – Targeted Outcome Level	S
Generic quality standard 2 – Learning Process	G
Generic quality standard 3 – Outcome Level Achieved	S

As Generic quality standard 1 is evaluated as satisfactory, Generic quality standard 2 is evaluated as good and Generic quality standard 3 is evaluated as satisfactory, the final judgement of the assessment panel about the Master of Science in Molecular Biology is satisfactory, according to the decision rules.

Summary of the recommendations for further improvement of the study programme

Generic quality standard 1 – Targeted Outcome Level

- Adopt the terms Animal and Plant Science instead of Production.
- Initiate a more extensive international benchmarking and international reflection on learning outcomes.
- Include non-communicable diseases in the Health profile.

Generic quality standard 2 – Learning Process

- Provide one or more individual pathways from the beginning, coherent with the background of the students.
- Provide more in-depth electives for the second-year students in line with their profile and thesis research topic.
- Consider making use of PointCarré for more advanced e-learning.
- Investigate the possibility to provide more development -relevant topics for the master's thesis in line with the learning outcomes for capacity-building.
- Have students submit the literature survey for their master's thesis several months earlier.
- Reflect on the communication (or the perceived lack of it) used by the programme.
- Work towards a realistic plan for the future with clear objectives in the short and medium term.

Generic quality standard 3 – Outcome Level Achieved

- Improve feedback on evaluation of exams.
- Provide a standardised evaluation format for the master's thesis at VUB, as is the norm at KU Leuven.
- Conduct an alumni survey periodically so that reliable data is collected on the employment of alumni in their home country

The assessment panel wishes to express its appreciation for the initiatives that are and will be taken to implement its suggestions. These include – based on the reflections during the first feedback round – discussions on the names of the Profiles, attention for non-communicable diseases, more extensive international benchmarking, training of staff in the applications of the different e-learning platforms, the use of a standardized evaluation form for the evaluation of the master's thesis.

KU LEUVEN & VRIJE UNIVERSITEIT BRUSSEL
Master of science in Water Resources Engineering

SUMMARY
Master of science in Water Resources Engineering
KU Leuven & Vrije Universiteit Brussel

From 12 to 15 May 2014, the Master of Science in Water Resources Engineering at KU Leuven and VUB has been evaluated in the framework of an educational assessment by a peer review panel of independent experts. In this summary which describes a snapshot, the main findings of the panel are listed.

Profile of the programme

The Master of Science in Water Resources Engineering addresses water-related issues in the developed and developing countries. The general programme objective is the training of graduates who will effectively contribute to the development and management of water resources, locally, regionally and globally. In addition, the programme also wants to address institutional, socio-economic, and policy issues of water resources development and management.

In a nutshell, the managers of the programme define the key objectives as follows: training in the use of numerical simulation tools for water management; and training in integrated water management.

The programme is jointly organised by KU Leuven and VUB.

Programme

The programme counts 120 ECTS and consists of two years. The first year is dealing with applied mathematics and statistics, basic components and processes of the hydrological cycle supporting techniques and tools. The second year is dealing with technical and socio-economic aspects of integrated water management. The master's thesis accounts for 30 ECTS.

During the first year, the most prevalent teaching methods are lectures and practical sessions (for training in techniques) or workshops (for specific or individual guidance of the students). Approximately half of the sessions in the first year are given in the form of practicals or workshops. During the second year, lecturing is drastically reduced, and the emphasis is shifted to workshops, group work, presentations by the students and self-study.

Evaluation and testing

The following evaluation formats are used: written and/or oral examinations, individual reports, group reports and presentations of personal research. The criteria and the exams are clearly explained by the lecturers at the beginning and at the end of their course.

The master's thesis has to be defended in public.

Services and student guidance

At the start of the academic year, the programme organises an information session for the students of the first and the second year. At VUB, potential students may also contact the Student Counselling Service. At KU Leuven, guidance for potential students is organised both at the central level and at the level of the faculties. In both Leuven and Brussels there is 1 full-time staff member who is responsible for the guidance of students during the programme. International students receive especially intense guidance.

The material facilities at both KU Leuven and VUB are adequate.

Study success and professional opportunities

The study completion rate over a period of 6 years is on average 93.8%. The pass rate of each intake cohort shows an average of 92.9% of the students obtaining a degree after three years. The majority of the students obtain their master's degree within 2 years.

Most of the foreign students already have professional experience before they come to Belgium. The majority of the graduates return to their former jobs, and most of them receive a promotion to a higher function because of their degree. For many graduates, these studies are also a first step towards PhD studies.

ASSESSMENT REPORT
Master of science in Water Resources Engineering
KU Leuven & Vrije Universiteit Brussel

Preface

This report concerns the Master of Science in Water Resources Engineering organised jointly by the Katholieke Universiteit Leuven (KU Leuven) and the Vrije Universiteit Brussel (VUB). The assessment panel (further referred to as the panel) visited the study programme during its visit to KU Leuven, from the 13th to the 15th of May 2014.

The panel assesses the study programme on the basis of the three generic quality standards (GQSs) of the VLUHR programme assessment framework. This framework is designed to fulfil the accreditation requirements set by the NVAO. For each generic quality standard, the panel gives a weighted and motivated judgement on a four -point scale: unsatisfactory, satisfactory, good or excellent. In the assessment of generic quality assurance, the concept of 'generic quality' indicates that the GQS is in place and that the programme – or a specific mode of the programme – meets the quality level that can reasonably be expected, from an international perspective, of a Master's programme in higher education. The score 'satisfactory' indicates that the programme meets the generic quality because it demonstrates an acceptable level for the particular GQS. If the study programme scores 'good', the programme systematically exceeds the generic quality for that standard. If the programme scores 'excellent', it achieves well above the generic quality for the particular GQS and serves as an (inter)national example. The score 'unsatisfactory' indicates that the programme does not attain the generic quality for that particular GQS.

The panel's opinions are supported by facts and analyses. The panel makes clear how it has reached its opinion. The panel also expresses a final opinion on the quality of the programme as a whole, also according to the same four-point scale. Judgements and recommendations relate to the programme with all subordinate modes or majors, unless stated differently.

The panel assesses the quality of the programme as it has been established at the time of the site visit. The panel has based its judgement on the self-evaluation report and the information that arose from the interviews with the programme management, lecturers, students, alumni and personnel responsible at programme level for internal quality assurance,

internationalisation, study guidance and student tutoring. The panel has also examined the course materials, Master's theses, test and evaluation assignments and standard answering formats, and numerous relevant reports available. For the student success rate, the panel has relied on the data provided by the programme management. The panel has also visited specific educational facilities such as classrooms, laboratories, experimental facilities and libraries during the site visit at the various universities.

In addition to its judgement, the panel also formulates recommendations with respect to quality improvement. In this manner, the panel wants to help improve the quality of the programme. The recommendations are included in the relevant sections of the respective generic quality standards. At the end of the report an overview is given of improvement suggestions.

Context of the study programme

The master of science in Water Resources Engineering consists of 120 ECTS credits, spread over two years. The programme (all variants) has 64 students enrolled (2012–2013). The programme is jointly organised by KU Leuven and VUB and is supported by 5 different faculties: the Faculties of Engineering and of Sciences and Bio-Engineering Sciences of VUB and the Faculties of Engineering, of Bioscience Engineering and of Sciences of KU Leuven.

In the early 1980s, initiatives were taken at VUB and KU Leuven to start post-graduate studies for students from developing countries related to water resources. At KU Leuven lecturers from civil and agricultural engineering selected the field of Irrigation Engineering, while at the Faculty of Engineering of VUB, a similar initiative was taken in the field of Hydrology. After a few years these programmes were transformed into 2-year Master of Science programmes either in Hydrology (Interuniversity Programme in Hydrology – IUPHY) or in Irrigation Engineering (Centre for Irrigation Engineering – CIE). In the early 90s, the two programmes joined forces and were able to organise a more advanced study programme in the broad field of Water Resources Engineering. This new programme was called the Interuniversity Programme in Water Resources Engineering (IUPWARE). In 1998 the master's programme in Water Resources Engineering became one of the 12 ICP programmes of the VLIR. Starting in the academic year 2007–2008, the 2-year programme became an initial master's programme

with a curriculum structure that has been broadly maintained until today. Under the new agreement, KU Leuven became the coordinating institution.

The programme combines basic knowledge in the broad domain of water resources together with specialised knowledge and skills in modelling. The broad basis is formed in the first year of the programme by courses covering the different scientific domains and courses related to ICT and data collection. The first year of the programme is primarily organised by KU Leuven, and during one full day per week classes are taught at VUB. Basic courses are offered to bring the students that come from different backgrounds up to the same level. Specialised courses in water resources engineering and modelling are offered in the second year. These are supported by two advanced courses for water management, one on system approach and one on the social, political, institutional, economical aspects of water resources. Integration of these skills and knowledge happens in the integrated project. The organisation of the second year is primarily in the hands of VUB, but courses are organised at the campus of the university that is responsible for the course. During the second year, specialisations are organised in irrigation, hydrology, water quality or aquatic ecology. The master's thesis research project allows for further individual specialisation.

The management of the programme is in the hands of the Steering Committee (SC) which is composed of 4 IAP (Independent Academic Personnel) members from the two institutes. The SC has a general responsibility for the management and quality assurance of the programme. educational matters are overseen by the Programme Committee for Water Resources Engineering (POC). THis is composed of all of the lecturing staff, representatives of assisting personnel and at least three student representatives.

Generic quality standard 1 - Targeted Outcome Level

The assessment panel evaluates the targeted outcome level for the Master of Science in Water Resources Engineering as good

The Master of Science in Water Resources Engineering addresses water -related issues in the developed and developing countries. The general programme objective is the training of graduates who will effectively contribute to the development and management of water resources, locally, regionally and globally. In addition, the programme also wants to

address institutional, socio-economic, and policy issues of water resources development and management. There is an emphasis on imparting knowledge and skills in modern data processing, modelling and analysis techniques, in combination with advanced engineering tools in the field of water resources engineering. In a nutshell, the managers of the programme define the key objectives as follows: training in the use of numerical simulation tools for water management; and training in integrated water management. A clear choice has been made for an emphasis on modelling -based engineering. The panel accepts this as a justifiable choice.

The panel observes a clear link between the programme -specific learning outcomes and the domain -specific learning outcomes, in terms of both level (master's) and orientation (academic). The programme -specific learning outcomes are firstly described in general programme objectives (the needs for water, problem -solving related to quantitative and qualitative water management plus socio-economic and policy issues). Numerical simulation tools and integrated water management are defined as key objectives. The panel supports this choice. Since the programme is unique in Flanders, the domain-specific learning outcomes defined for Water Resources Engineering (at the level of Flanders by the members of the Flemish Interuniversity Council in 2013) are identical to the learning outcomes of the master's programme. The panel considers this formulation sufficiently concrete to adopt it as learning outcomes and sees a strong academic orientation, with an adequate professional component.

The profile is compared with national and international standards. Choices have been made with respect to other international programmes, and the focus is on the broad spectrum of water management problems. The panel appreciates the comparison with targets of other universities, the benchmarking with related programmes and the efforts to enable the stakeholders to validate the learning outcomes. benchmarking with water -related programmes in Belgium and Europe has been made, but the panel encourages the managers of the programme to continue the efforts concerning benchmarking with institutes in the North and the South. On the other hand, professional organisations and alumni were sent a questionnaire. The panel is pleased about the good response on this survey. It also became clear in the discussions that the managers of the programme take the remarks very seriously. This has resulted in the installation of a working group, which also deserves the appreciation of the panel.

In conclusion, the panel appreciates the emphasis on modelling -based engineering and supports the choice of numerical simulation tools and integrated water management as key objectives. A clear link between the programme -specific learning outcomes and the domain -specific learning outcomes is established. Finally, comparison with targets of other universities, benchmarking with professional organisations and related programmes, and the efforts to enable the stakeholders to validate the learning outcomes, are appreciated.

Generic quality standard 2 - Learning Process

The assessment panel evaluates the learning process for the Master of Science in Water Resources Engineering as satisfactory

The 2-year programme of 120 ECTS credits consists of 8 compulsory courses (6 ECTS each) in the first year, dealing with applied mathematics and statistics and with the basic components and processes of the hydrological cycle; and 4 compulsory courses (3 ECTS each), dealing with supporting techniques and tools, such as measurement techniques and data -handling techniques. In the second year there are 2 compulsory courses (5 ECTS each), dealing with technical and socio-economic aspects of integrated water management; a selection of 3 elective courses (5 ECTS each), dealing mainly with numerical modelling issues or with irrigation or aquatic ecology; an integrated project (5 ECTS) and the master's thesis research project (30 ECTS).

The self-evaluation report provides a curriculum mapping, based on a survey among the lecturers. It shows that the curriculum covers all the learning outcomes. The panel is positive about the didactic approach, the teaching methods and their relation to the learning outcomes. However, the panel observed an imbalanced attention to the various competence areas in the programme. During the first year, the most prevalent teaching methods are lectures and practical sessions (for training in techniques) or workshops (for specific or individual guidance of the students). Approximately half of the sessions in the first year are given in the form of practicals or workshops, which allow specific or individual guidance of the students. This is needed, given the great diversity of background. For the practical sessions, reports have to be worked out individually or in small groups. Practical training and laboratory sessions are also organised in the field. Still, in the context of the programme in general, the panel observes a focus on knowledgeacquisition, while other competences are less present in the programme (for example attitudes and skills such

as working together in group, presentations, etc.). Especially in the first year, a wider range of educational forms should be used. During the second year, lecturing is drastically reduced, and the emphasis is shifted to workshops, group work, presentations by the students and self-study. Through their assignments, students gain a better insight in the processes and algorithms and gain experience in data preparation, processing, analysis and evaluation and model calibration. The panel therefore sees a better picture in the second year, but still believes more efforts are needed, Especially given the formulation of the objectives, in which competences are conceived as more than knowledgeacquisition.

In general, the programme enables the students to reach the objectives. The programme -specific learning outcomes are well covered by the different courses of the curriculum. The panel appreciates the fact that much attention has been paid to (international) future developments. However, the panel wants to draw attention to some specific remarks, of which the most important one concerns the presence of integrated water management in the curriculum. The panel is positive about the fact that this is clearly formulated in the programme -specific learning outcomes, in the form of one of the key objectives. Hence, it is clear that this aspect is considered as important by the managers of the programme. The panel appreciates this, but in implementation this aspect is somewhat lacking: according to an alumni survey, the self-evaluation report and the interview with the students, the second key objective receives less attention. Of the two key objectives (key objective one: modelling/simulation; and key objective two: integrated water management) the emphasis is on the first. With respect to integrated water management, the implementation mainly depends on one course: the integrated project of the second year alternatively treats water resources management in a humid climate (Belgium) or in an arid climate (Burkina Faso, Ecuador). Integration of the different aspects of water resources management and teamwork are key issues for this course, but in the programme in general the focus is on the first key objective. The panel is of the opinion that the programme enables the students to reach both key objectives, but in comparison with key objective one, the representation of key objective two in the programme is weaker.

The panel also suggests integrating more economic, social and political aspects in this approach, including capacity -building. The panel sees an interesting profile, in the sense that the programme managers state that a programme in modelling -based engineering is offered. However, it is

of the opinion that a problem concerning visibility arises in this context, because in the objectives a wider range of competences is aimed for. Economic, social and political aspects should be integrated in the present focus on modelling -based engineering. The panel points out a risk of misrepresentation of the programme, for example to incoming students. Regarding future improvements, the managers of the programme have to find a way to make those aspects of the programme that are also emphasised in the learning outcomes more visible.

The quality of the staff is adequate: the panel saw a committed team. As a rule, teaching staff are only appointed for a course if they conduct research in the field related to the course. The panel observed that the teaching staff consist of dedicated teachers and highly valued experts in the field, including in the international context. The staff is exposed to the international field and especially to problems in the South. International cooperation is well institutionalised, with teaching staff working in developing countries and cooperating with many international universities. However, an effort should be made to pay more attention to other aspects (which are also formulated in the objectives) besides modelling -based engineering. The panel sees that most of the required expertise is present to offer a programme in water resources engineering, but in line with previous remarks the professional aspect should be strengthened. The panel is of the opinion that in the staff too, more social, economic and political expertise is needed to strengthen integration, with a stronger focus on capacity -building and integrated water management here too. Concerning the teaching qualities of the staff, the panel is relatively satisfied. Different types of educational training are offered by the host universities, but the staff seem to have too little time to follow courses. However, The lecturers appear to have a clear student-centred attitude and experience regarding interdisciplinary team work through various research projects that involve multidisciplinary teams. In general, the research and teaching quality of the staff ensures that they have the expertise and skills to guide the students to reach the learning outcomes. The academic staff are evaluated every 3 to 5 years by the central quality control departments. the results show that 85% of the students are satisfied with the quality of the staff.

The number of teaching staff is sufficient to cope with the actual programme, but according to the self-evaluation report the assistant teaching staff have reached their limits in dealing with links with other programmes. 18 staff members belonging to the independent academic

staff, 7 of whom belong to VUB (4 FTEs), 10 to KU Leuven (8.2 FTEs) and 1 with a double affiliation. This staff is supplemented by an international group of motivated research assistants (mostly PhD students), who deal with practical sessions, workshops and thesis guidance. Most of them are paid from the resources of the IAP (Independent Academic Personnel) members who contribute to the programme (projects, scholarships, etc.). For the administration, 2 FTEs are available (1 at each institution).

The secretariat receives about 200 to 250 applications each year. Of those, 16 applicants from developing countries are selected to receive a two-year scholarship from VLIR, to cover their study and living expenses in Belgium. The selection for the scholarships is based on selection criteria set by the VLIR as well as our own academic admission criteria that apply to all students. Applicants from non-native English speaking countries should have a TOEFL score of at least 550 (213) on the written (computer-based) test or an equivalent language test. Applicants who have already obtained a master's degree from an EEA university (European Economic Area), can be exempted from 60 ECTS subject to the approval of the Programme Committee. The number of female students is relatively low (30%). Students from Africa (36%), Asia (38%) and South America (10%) come from a large number of countries, as a result of the VLIR scholarship policy. The number of Belgian students (6%) and non-Belgian EEA students (9%) has increased in the last couple of years, thanks to the abridged programme that was introduced in 2010.

The panel is positive about the material facilities, supporting the students in their learning paths. The programme normally uses the facilities provided by the faculties/universities that participate in the programme. In this context the panel observed a positive situation concerning class rooms, ICT infrastructure and libraries. Also, use is made of the hydraulics lab of the faculty of engineering of KU Leuven and of research equipment that belongs to the different research teams that contribute to the programme. A survey indicates that 85% of the students are satisfied with the facilities offered by the programme. Public domain software tools are generally preferred. The panel learned that 14% of students have difficulties with ICT, which is an aspect that deserves further attention.

Like the material facilities, the facilities concerning the guidance of the students pose no problems. According to the alumni, student guidance is very good. The programme-specific services are administratively supported by 2 FTEs (1 at each institution). International students receive

intense guidance. Information for potential students is available through the website of the programme and through a brochure. The brochure is available at the secretariats of the coordinators and is further distributed at information days of both universities. International students are informed about the existence of the programme through alumni and through the information that is distributed to embassies and interested institutions by VLIR-UOS. At the start of the academic year, the programme organises an information session for the students of the first and the second year, at which the academic staff and study counsellors give an initial explanation of the programme and of life at both universities. At VUB, potential students may also contact the Student Counselling Service. This service offers individual assistance on academic issues such as general academic requirements or qualifications and choosing the right programme. At KU Leuven, guidance for potential students is organised both at the central level (by the Study Advice Service, by the International Admission and Mobility (IAM) unit of the International Office), and at the level of the faculties. In both Leuven and Brussels there is 1 full-time staff member who is responsible for the guidance of students during the programme. The panel appreciates this. international students receive especially intense guidance.

Guidance of students in connection with their master's thesis follows adequate procedures. Students are informed about possible thesis subjects by means of a list of topics that is made available during the second semester of stage one. They are invited to discuss the topics of interest to them with the promoters. The list of topics, as chosen by the students, is discussed during a meeting of the POC at the beginning of the next academic year. The students would like to have more opportunities to choose a topic that is related to their home country. further follow-up is organised in the framework of the thesis component "Setting up a research project", during which the students have to give a presentation about their research plan in January. During the second semester, the thesis component "Research methods for data collection and processing" provides further guidance to students. The actual supervision of the thesis research is the responsibility of the individual promoters, assisted by PhDstudents. The panel wants to point out a risk in this context, given the limited time PhDstudents have to finish their own project. It is important for students to be relatively free in the design of their project, despite the limited time and financial resources of the phdstudent who provides the guidance. The panel did not hear any problems from the students, but still wants to point out this aspect as a risk in the context of the present approach.

In general, the students experience the study load as corresponding to the assigned course credits. The panel is also of the opinion that all the aspects concerning the programme, the support, the staff and the students come together in an adequately coherent learning environment. The active POC gives a positive impression about the strong commitment of the staff and the students, which contributes to this coherence: all the parties are very involved in offering a qualitative and coherent programme. The panel appreciates the fact that this also includes the alumni and the students. The approach is also formalised in frequent meetings of the POC. However, in this same context, integrated water management deserves follow up. But apart from this aspect, the coherence of the programme as a whole is good.

A new curriculum was launched in 2007–2008. major changes were made based on the remarks of the previous assessment panel, and mainly concerned internationalisation, social/political/institutional context, and the reorganisation of the master's thesis approach. There was a substantial follow-up on the remarks made by the previous panel. The majority of the remarks have been taken care of. The implementation of the abridged programme is an example of a good initiative in this follow up. The panel also read in the self-evaluation report that efforts were made to pay more attention to social, economic and political issues in the programme. But in line with the remarks above, the panel is of the opinion that this work is not yet finished. some other recommendations have also received less prominent follow-up (for example the tailoring of the basic courses in the first semester to the background of incoming students, the need for more active learning methods in the first year and the suggestion that a single pedagogic approach – project based learning – should be used). The panel is of the opinion that more attention to follow -up is needed. On the other hand, the panel appreciates the fact that evaluations are organised after every course. These regular evaluations of the research and teaching quality of the staff strongly support the quality of the curriculum. The panel recommends continuing these evaluations at programme level. The feedback on the results of these evaluations to students requires follow-up, however: according to the self-evaluation report, 27% of students consider that there are not enough opportunities to raise problems and 42% of them consider that they are not well informed about the results of the quality. On the other hand, the panel appreciates the fact that the opinions of alumni and professionals have been taken into account.

In conclusion, the panel saw a qualitative programme, supported by a committed staff, adequate material facilities and guidance, in which all

the pieces fit together in a coherent structure, but in which more effort is needed to strengthen the link between the learning outcomes and implementation, especially regarding integrated water management. In the context of these measures, more attention should be given to social, economic and political issues, both in the programme and in the staff, and more attention should be given to capacity -building. The panel is of the opinion that, at present, the programme can be assessed as satisfactory, but it would encourage the managers of the programme to make more efforts in order to make even more optimal use of the existing potential.

Generic quality standard 3 - Outcome Level Achieved

The assessment panel evaluates the outcome level achieved for the Master of Science in Water Resources Engineering as good

The Programme Committee monitors the quality of the examinations in a systematic manner, passes on criticisms and observed shortcomings to the lecturers and makes adjustments if necessary. Curriculum mapping is done by the Curriculum Committee. In addition, statistics of exam results are examined in the Programme Committee and a 2-yearly KU Leuven-wide online student survey. In this way, the Programme Committee ensures that exams are representative, reliable and transparent. Although the assessment, evaluation and examinations are constantly monitored by the Programme Committee, the programme's vision of the system of student assessment, evaluation and examination is so far not formally reported in an official document. During Programme Committee meetings in the academic year 2012 – 2013, a vision text was discussed, updated and revised. The panel recommends continuing this important work concerning the assessment policy and vision.

The broad range of assessment methods is clearly aligned to testing whether the learning outcomes are achieved. The learning outcomes assessed in the examinations are listed in a matrix of curriculum mapping for each course and workshop and for the master's thesis research. All learning outcomes are assessed in several course units. The panel is of the opinion that the evaluation format is adjusted to the learning outcomes. The following formats are used: written and/or oral examinations, individual reports, group reports and presentations of personal research. The panel considers this to be an adequate variation in assessment methods, adjusted to the learning results. In the context of future improvements, the programme should develop a test-matrix on formal teaching methods and ways of evaluations, so the balance in teaching and evaluation is better expressed.

The panel advises the programme management to be vigilant about the amount of feedback given to the students. At the end of each examination session, students receive a document with their obtained grades and are given the opportunity to discuss their grades with the lecturers. The Programme Committee requests lecturers to schedule mock examinations in the middle of the semester. Interim presentations for the integrated project and the master's dissertation are regularly scheduled throughout the semester. Fellow students and lecturers provide feedback at such occasions. For the workshops, intermediate (simulation) results are discussed with the lecturers during the successive sessions.

On the other hand, the panel is positive about the transparency of the assessment. Students are positive about the way the expectations are made clear to them. The criteria and the exams are clearly explained by the lecturers at the beginning and at the end of their course, according to the students and the lecturers themselves. Also, the organisation of the assessment procedures is good. In an information session scheduled during the first week of the academic year, information on the exam regulations and the role of the exam ombudsperson are provided. The examination schedule for each session is available online at the start of each semester. The information on the mode of examination is not only provided online (ECTS syllabi), but also explained by the lecturers (at least) in the first and last lecture. Typical examination questions are provided by the lecturers during the class hours.

The evaluation of the master's thesis is also well organised. The master's research consists of the 3 courses which allow the programme management to give feedback to the students and to fully assess the conducted research. At the end of the first semester of the second phase, students have to prepare a report defining the research question, objectives and research methodology. At the end of each of the 4 seminars, students present their master's research to their fellow students and the lecturer, who provides feedback. If failed, the thesis cannot be defended and the modules have to be re-evaluated before the thesis defence. At the end of the second semester of the second phase, students report their research in a manuscript which is distributed to the jury. During the oral defence the student presents the conducted research (15 to 20 minutes), and the jury is given the opportunity to discuss the research with the students and/or ask for clarification (15 to 20 minutes). The master's research (manuscript, presentation of the results and oral defence) is assessed by at least three jury members, at least one of whom was not actively involved in the

research. The assessment covers all aspects of the research. An evaluation matrix is used, which deserves the appreciation of the panel. All defences are chaired by the same chairperson to ensure uniform assessment across all students. The score on the thesis defence amalgamates the weights of all the thesis-related modules, 30 ECTS in total. In some cases, the panel finds the score quite low, but evidently it cannot include the oral presentations in its assessment. In general the master's thesis points to the achievement of a high level by the students. Despite some variation in the presence of a satisfactory introduction and conclusion, the panel is very positive about the achieved level.

Concerning pass rates and the number of drop-outs, the panel sees no problems. The study completion rate over a period of 6 years is on average 93.8%, which is an indication of the fact that the curriculum, staff and services are good. Over the 3 years with reliable data (2007, 2008, 2009), we had a total intake of 85 students (27 in 2007, 27 in 2008, 31 in 2009). Of these 85 students, 10 (11.8%) obtained their degree after one year of study, 65 (76.5%) after two years, 4 (4.7%) after three years, and the remaining 6 students (7.1%) never obtained the degree. The pass rate of each intake cohort shows an average of 92.9% of the students obtaining a degree after three years. The majority of the students obtain their master's degree within 2 years. The fact that 10 students obtained their degree in one year is due to the fact that, from the 2008–2009 academic year onwards, the abridged programme started. The panel considers this a positive development. The existing number of drop-outs is considered as explicable, and not due to programme- or guidance -related aspects.

The panel is very positive about employability. The link with the professional field is indicated by the fact that 95% of the alumni are able to find a job quickly. Most (foreign) graduates confirm that they obtained a job immediately after their return, or at least within one year. While a majority of the members of the alumni group hold non-research positions, a sizable fraction is presently involved in junior or senior research positions (including academic positions). The management and administrative positions are in both private companies and public organisations. Consultants' positions are mainly at consultancy firms. The researchers are both PhD students and research officers. The academics are lecturers at universities. Most of the foreign students already have professional experience before they come to Belgium, as this is one of the requirements for obtaining a scholarship from VLIR. The majority of the graduates return to their former jobs, and most of them receive a promotion to a

higher function because of their degree. All the graduates state that the programme is very important and essential for their job and career, and declare that they have obtained a job immediately after their return or at least within one year after they return home. For many graduates, these studies are also a first step towards PhD studies. Given the existing satisfaction of the alumni, the panel is very positive about this situation.

In conclusion, the panel advises the management to set out its vision of the system of student assessment, evaluation and examination in an official document. On the other hand, the broad range of assessment methods is aligned to testing whether the learning outcomes are achieved. The panel advises vigilance about the amount of feedback, but it is positive about the transparency of the assessment. The evaluation of the master's thesis is adequately organised and the quality of master's theses indicates that a good level is achieved by the students. Concerning the pass rates, drop-out rate and employability, the panel sees no problems.

Final Judgement of the assessment panel

Generic quality standard 1 – Targeted Outcome Level	G
Generic quality standard 2 – Learning Process	S
Generic quality standard 3 – Outcome Level Achieved	G

As Generic quality standard 1 is evaluated as good, Generic quality standard 2 is evaluated as satisfactory and Generic quality standard 3 is evaluated as good, the final judgement of the assessment panel about the Master of Science in Water Resources Engineering is good, according to the decision rules.

Summary of the recommendations for further improvement of the study programme

Generic quality standard 1 – Targeted Outcome Level

- Rebalance knowledge as a competence in relation to other intellectual and social intelligence competencies.
- Continue the benchmarking with institutes in the North and the South.

Generic quality standard 2 – Learning Process

- Balance the attention to the various competence areas in the programme; use a wider range of educational forms, especially in the first year.
- Balance the attention to the two key objectives of the programme; implement more than one course with respect to integrated water management.
- Integrate economic, social and political aspects in the present focus on modelling -based engineering; make those aspects of the programme that are also emphasised in the learning outcomes more visible; involve more than 1 staff member with an economical/political background in the programme; strive for a stronger focus on capacity -building and integrated water management.
- Strengthen the professional aspect of the programme.
- Make more time for educational training offered by the host universities.
- Reduce the difficulties the students experience with ICT.
- Strive for more opportunities for students to choose a master's thesis topic relevant to the home country.
- Continue to conduct evaluations at programme level, but pay more attention to follow -up and feedback of the results of staff evaluations to students.

Generic quality standard 3 – Outcome Level Achieved

- Report the vision on the system of student assessment, evaluation and examination formally in an official document.
- Develop a test-matrix on formal teaching methods and ways of evaluations, so the balance in teaching and evaluation is better expressed.
- Increase the amount of feedback given to the students.
- Reduce the variation in the presence of a satisfactory introduction and conclusion in the master's theses.

KU LEUVEN
Master of Science in Bioinformatics
Master of Science in de bio-informatica

SUMMARY
Master of Science in Bioinformatics
Master of Science in de bio-informatica
KU Leuven

From 12 to 15 May 2014, the Master of Science in Bioinformatics and the master of Science in de bio-informatica at KU Leuven has been evaluated in the framework of an educational assessment by a peer review panel of independent experts. In this summary which describes a snapshot, the main findings of the panel are listed.

Profile of the programme

The overall objective of the programme is to train qualified bio-informaticians, who will be able to integrate biological knowledge and insight with the knowledge and understanding of important principles of information technology, mathematics, and statistical techniques. The expertise in bioinformaticians consists of the ability to design, manage, analyse, and interpret data from high-throughput molecular biological experiments that are characterised by high complexity and dimensionality and to independently develop new methods for solving future bioinformatics challenges.

The master of Science in in Bioinformatics has a Dutch variant, the Master of Science in bio-informatica. The master of Science in Bioinformatics is completely taught in English, whereas the Dutch variant master of

Science in bio-informatica is taught predominantly in Dutch with a minor component in English.

Programme

The programme counts 120 ECTS and consists of two years. There are three specialisations (each in Dutch and English variants): Science, Bioscience Engineering and Engineering. The first year offers five reorientation packages: those for biology, statistics, mathematics, information technology and optional courses. The goal of each package is to remediate insufficient background knowledge in specific scientific domains. Students are advised to select an individual specific set of course units from two or more reorientation packages. The remaining credits in the first year are compulsory courses, arranged within three common packages: bioinformatics, biology and statistics.

Depending on the background, there is to some extent freedom in the composition of the reorientation package. Students with a (bioscience) engineering (or international equivalent) background have greater opportunity to tailor their programme to their individual profile. They are allowed to take course units from a list of optional courses, or make an individual proposal. Students with a background specific to one science domain will need a full package of reorientation courses to fill their programme.

The second year is again characterised by compulsory common packages of course units which belong to the common package statistics module and the common package bioinformatics module. A master's thesis accounts for the remaining 30 ECTS.

As well as a number of courses that focus on knowledge acquisition (for example, biology and mathematics), usually through a combination of theory and exercises, there are a number of bioinformatics and ICT courses with a significant emphasis on hands-on computer-based exercises. In addition to this, a specific sequence of ICT-oriented bioinformatics courses is programmed to increase step by step the practical computing skills of the students. This results in the preparation and oral presentation of a mini-project and of a comprehensive project in the course 'Integrated Bioinformatics Project'.

Evaluation and testing

The oral exam is the most used evaluation form (43%). Besides this format, other evaluation forms such as written exams (32%), presentations (16%) and self-assessment/peer assessment (10%) are organised throughout the programme. The master's thesis has to be defended in public.

In the first lecture, the lecturer informs the students of how the evaluation will take place. For every course where homework and papers have to be produced, it is expected that students will receive intermediate feedback.

Services and student guidance

In September a welcome session for first- and second-year students is organised. Primarily for international students, a system of personal buddies has been set up: someone in the second phase will be the mentor of an incoming student and can help him or her with practical issues. Students highly appreciate the master's thesis supervision.

Lectures are organised at the Arenberg Campus in Heverlee, a part of Leuven. All classrooms are well equipped. However, because computing requirements in bioinformatics have grown explosively in the last few years, there is a need for computing servers that are capable of handling student exercise sections requiring significant computer power. At the time of the site visit, the programme was finalising a structural solution

Study success and professional opportunities

The study efficiency fluctuates between 63% and 79%. Nearly all students who obtain their diploma succeed in doing this within two years.

Every December a career event and a PhD event are organised. During the site visit the assessment panel learned that not all students are well aware of their career perspectives, often thinking that a PhD is the only outlet. The alumni that were interviewed by the panel underlined however that the programme provides the right background and methodology to succeed in a wider range of (non-research related) jobs.

ASSESSMENT REPORT
Master of Science in Bioinformatics
Master of Science in de bio-informatica
KU Leuven

Preface

This report concerns the master of science in Bioinformatics at KU Leuven. The assessment panel visited the study programme from to 15 May 2014.

The panel assesses the study programme on the basis of the three generic quality standards (GQSs) of the VLUHR programme assessment framework. This framework is designed to fulfil the accreditation requirements set by the NVAO. For each generic quality standard, the panel gives a weighted and motivated judgement on a four point scale: unsatisfactory, satisfactory, good or excellent. In the assessment of generic quality assurance, the concept of 'generic quality' indicates that the GQS is in place and that the programme – or a specific mode of the programme – meets the quality level that can reasonably be expected, from an international perspective, of Master's programme in higher education. The score 'satisfactory' indicates that the programme meets the generic quality because it demonstrates an acceptable level for the particular GQS. If the study programme scores 'good', the programme systematically exceeds the generic quality for that standard. If the programme scores 'excellent', it achieves well above the generic quality for the particular GQS and serves as an (inter)national example. The score 'unsatisfactory' indicates that the programme does not attain the generic quality for that particular GQS.

The panel's opinions are supported by facts and analyses. The panel makes clear how it has reached its opinion. The panel also expresses a final opinion on the quality of the programme as a whole, also according to the same four-point scale. Judgements and recommendations relate to the programme with all subordinate modes or majors, unless stated differently. As explained below, the current report only relates to the English –language variant – there are no students in the Dutch variant – but the two programmes are 100% identical.

The panel assesses the quality of the programme as it has been established at the time of the site visit. The panel has based its judgement on the self-evaluation report and the information that arose from the interviews with the programme management, lecturers, students, alumni and personnel responsible at programme level for internal quality assurance,

internationalisation, study guidance and student tutoring. The panel has also examined the course materials, master's theses, test and evaluation assignments and standard answering formats, and numerous relevant reports available. For the student success rate, the panel has relied on the DHO tables. The panel has also visited the educational facilities such as classrooms, laboratories and the library.

In addition to its judgement, the panel also formulates recommendations with respect to quality improvement. In this manner, the panel wants to help improve the quality of the programme. The recommendations are included in the relevant sections of the respective generic quality standards. At the end of the report an overview is given of improvement suggestions.

Context of the study programme

The Master of science in Bioinformatics consists of 0 ECTS credits, spread over two years. The programme (all variants) has students enrolled (2012-2013). The programme is jointly organised by the Faculty of Bioscience Engineering, the Faculty of Engineering Sciences, the Faculty of Medicine and the Faculty of Science of KU Leuven. The programme can be followed in Dutch or English. At the moment of the assessment (and the writing of the SER), no student was registered in the Dutch programme. Both language variants have three specialisations: Bioscience Engineering, Engineering and Science. The Bioscience Engineering major leads to the additional professional title 'bio-ingenieur' (bio-ir), while the Engineering major leads to the professional title 'burgerlijk ingenieur' (ir.).

The initiative of starting a Master's programme in bioinformatics at KU Leuven was based on the great need for bioinformatics expertise in molecular biology. It coincided with the increasing international recognition of the importance of bioinformatics research. As bioinformatics is an inherently interdisciplinary field requiring sound knowledge of both mathematics and biology, its content fitted with the philosophy of the Faculty of Bioscience Engineering of KU Leuven. To further emphasise and provide a foundation for its interdisciplinary character, collaboration with the Faculties of Engineering Sciences, Sciences, and Biomedical Sciences was considered essential. The Master of Bioinformatics programme is a relatively young programme, which was initially set up as a one-year postgraduate Master's programme in 2001-2002 before turning into a two-year initial Master's programme in 2007-2008. An additional comprehensive programme reform took place in 2013-2014.

The Faculty of Bioscience Engineering is the administratively responsible faculty. This implies in particular that 1) the dean of the Faculty of Bioscience Engineering makes decisions regarding assignments of lecturers to courses of the programme, (2) master's theses are managed under the administrative process of the faculty, and (3) internal and external PR activities are managed in collaboration with the faculty. Other faculties are primarily involved through the lecturers active in the programmes. The programme director coordinates with the dean of the faculty regarding educational and teaching staff matters, and with the programme director of the Master of Bioscience Engineering and the administrative director regarding administrative matters.

Duties of the Permanent Educational Committee (POC) relate to the vision, aims, content, educational goals, evaluation, and feedback of the training programme. The POC consists of lecturers from the four organizing faculties (4x3), student representatives (4), and representatives of the teaching and research assistants (2) directly involved in the programme. Since academic year 2013-2014, the POC has also welcomed a representative of the professional field. A key tool for the management and quality control of the programme is the weekly 3 meetings between the programme director and the programme secretary.

Generic quality standard 1 - Targeted Outcome Level

The assessment panel evaluates the targeted outcome level of all varients as satisfactory

Two major developments have led to the organisation of a Master's programme in bioinformatics. Firstly, recent scientific and technological breakthroughs combined with an impressive revolution in hardware and software technology have drastically changed the way of thinking in biology. Bioinformatics is an interdisciplinary field combining molecular biology, information technology for handling data, and mathematical and statistical analysis methods. Since bioinformatics is playing a more and more prominent role in science and industry, interest from industry, the Flemish Institute for Biotechnology (VIB) and the Flemish government has been growing steadily. This is the reason why the Master of Bioinformatics, unique in Flanders, was started by the KU Leuven in 2001. With this initiative the participating faculties follow a prominent international trend. Because of the strong interest in the programme from foreign students and because of the strong interest of local students in following a programme in English, the English -language programme has been the

principal option from the start of the programme. A second reason for the organisation of an English -language programme is that the professional environment for graduates with a Master's in Bioinformatics is strongly influenced by the English language.

The **overall objective** of this two-year programme is to train qualified bioinformaticians, who will be able to integrate biological knowledge and insight with the knowledge and understanding of important principles of information technology, mathematics, and statistical techniques. The expertise in bioinformaticians consists of the ability to design, manage, analyse, and interpret data from high-throughput molecular biological experiments that are characterised by high complexity and dimensionality and to independently develop new methods for solving future bioinformatics challenges. The assessment panel regrets that the learning outcomes do not address ethics and scientific integrity (essential for the future of bioinformatics), but overall the objectives are seen as very ambitious, directed towards a **high academic level**. In particular the interdisciplinary approach is admirable.

The programme has defined **learning outcomes**, common to all variants. The master in Bioinformatics being unique in Flanders, no distinction was made between programme-specific and domain-specific requirements. Regarding the Dutch and English Science specialisation, the programme learning outcomes comply with the Flemish qualification framework and – evidently – with the domain-specific learning outcomes too. Regarding the Dutch and English Bioscience Engineering and the Dutch and English Engineering specialisation, the panel states that the programme has not defined any additional learning outcomes, despite the two majors having clearly different purposes. Although the program-specif and domein-specific requirements match, the panel suggests to reinforce the engineering competences in the learning outcomes for both variants. The programme has done some profiling against similar programmes in the French-speaking part of Belgium and in the Netherlands. According to the SER, this comparison shows a focus on the integration of biology and informatics in the KU Leuven programme, 'without too much focus on statistics, modelling, and systems biology.' Objectives have also been based on international literature and contacts with the professional field. The assessment panel values these forms of **benchmarking**, although the comparison seems somewhat focused on finding reasons to conclude that the KU Leuven programme is unique, instead of learning and reflecting on possible gaps.

In conclusion, the panel finds that the programme's learning outcomes for all variants comply with all formal requirements. The assessment panel regrets that the learning outcomes do not address ethics and scientific integrity (essential for the future of bioinformatics), but overall the objectives are seen as very ambitious, directed towards a **high academic level**. The panel finds that a stronger profiling of the programme learning outcomes of the Dutch and English Bioscience Engineering and the Dutch and English Engineering specialization is appropriate.

Generic quality standard 2 - Learning Process

The assessment panel evaluates the learning process of the Dutch and English Science specialisation as satisfactory.

The assessment panel evaluates the learning process of the Dutch and English Bioscience Engineering specialisation as unsatisfactory

The assessment panel evaluates the learning process of the Dutch and English Engineering specialisation as unsatisfactory

The master in Bioinformatics has English and Dutch **language variants**. The English-language variants are completely taught in English, whereas the Dutch language variants are taught predominantly in Dutch with a minor component in English. Course units in the Dutch-language variants have their English equivalent in the English-language variants. Students of both programmes can attend the course units in English, which are identical in both variants. All variants have a common programme of 150 SP. Only the master's thesis (30 SP) belongs to a particular major.

The programme consists of three **specialisations (each in Dutch and English variants**): Science, Bioscience Engineering and Engineering Science. The **first year** offers five reorientation packages: those for biology, statistics, mathematics, information technology and optional courses. The goal of each package is to remediate insufficient background knowledge in specific scientific domains. Students are advised to select an individual specific set of course units (with a value of 27 ECTS) from two or more reorientation packages. The remaining credits in the first year are compulsory courses, arranged within three common packages: bioinformatics, biology and statistics.

Depending on the background, there is to some extent freedom in the composition of the reorientation package. Students with a (bioscience)

engineering (or international equivalent) background have greater opportunity to tailor their programme to their individual profile. They are allowed to take course units from a list of optional courses, or make an individual proposal. Students with a background specific to one science domain will need a full package of reorientation courses to fill their programme.

The **second year** is again characterised by compulsory common packages of course units which belong to the common package statistics module and the common package bioinformatics module. The total of credits for compulsory common course units over the two years (or 'phases') is 63. A master's thesis accounts for the remaining ECTS.

Topics such as **ethics**, **privacy** and **social implications** of bioinformatics are incorporated in various courses. However, it is not clear which courses substantially pay attention to the fundaments of ethics. The panel therefore advocates the creation of a separate course dealing with these issues, or at least making them much more visible in existing courses

The programme has good variation in **teaching methods**. As well as a number of courses that focus on knowledge acquisition (for example, biology and mathematics), usually through a combination of theory and exercises, there are a number of bioinformatics and ICT courses with a significant emphasis on hands-on computer-based exercises. In addition to this, a specific sequence of ICT-oriented bioinformatics courses is programmed to increase step by step the practical computing skills of the students. This results in the preparation and oral presentation of a mini-project in the course 'Omics Techniques and Data Analysis' and of a comprehensive project in the course 'Integrated Bioinformatics Project'.

The content and structure of the Dutch and English Science specialisation programme cover all learning targets. Much effort is made to establish links between informatics and biosciences. However, the panel has serious concerns regarding the content and structure of the curriculum of the Dutch and English Bioscience Engineering specialisation and the Dutch and English Engineering specialisation. As there is a significant difference in the intended purpose of these majors (in view of the different professional title), the panel considers it important to pay sufficient attention to the development of engineering skills. The current contents and design of the programme are fully shared with the exception of the master's thesis. The objectives and content of the master's thesis modules, as stated in

the ECTS files, however, are identical for all majors. The panel considers it necessary for the programme management to quickly reinforce the content of the programme, including the master's thesis, of both majors in terms of engineering competencies. For students who follow the Dutch and English Bioscience Engineering specialisation or the Dutch and English Engineering specialisation – needing distinctly less reorientation courses – it might sometimes be difficult to create an optimal package of alternative courses, especially because of course planning difficulties. According to the programme managers, some overlap of courses is currently 'inevitable' as this is a problem general to the whole university. The programme is now considering offering dedicated packages for the first semester of the two engineering tracks and increasing the focus on (bio)engineering. The committee considers it necessary for the programme management to address this matter quickly in order to provide minimal guarantees regarding the content and design of these majors.

For the **master's thesis**, topics range from practically oriented to research -based. From 20-20 on, a dedicated session for the presentation of thesis topics is organised in the second semester. Students and daily supervisors and/or advisors meet regularly to evaluate progress, so that students do not delay starting work on their thesis. Another practical issue involved is the fact that students tend to work on their thesis in July and August, a difficult time to maintain regular contact with advisors. Currently, semi-formal intermediate thesis presentations are held in most labs supervising a master's thesis on the initiative of students and advisors. The programme management will strive to formalise this intermediate presentation to guarantee that each student has the opportunity to receive appropriate feedback. According to the SER, feedback from daily supervisors shows that some students do need to be activated through interim deadlines.

Students told the assessment panel that they highly appreciate the thesis **supervision**. According to the SER, feedback from alumni points in the same direction. The panel values the fact that students are encouraged to write the thesis in a domain they are not familiar with. However, this is often so challenging for students that extra guidance and planning should be guaranteed. If not, students will be less inclined to step outside their 'comfort zone'.

A key feature of the programme is its reliance on **team teaching**, making it interdisciplinary. The collaboration of staff expertise from four different faculties is obviously an asset. Because of the team teaching and the extra

courses associated with the reorientation packages, a large number of lecturers are associated with the programme. The current involvement of staff is 16 full professors, 8 professors, 5 associate professors, 6 assistant professors and 4 invited lecturers. The total number of study points of courses available in the programme (outside the master's thesis and optional courses) is 117. The total number of lecturers is 39. Hence, the average number of study points taught by each lecturer is 3. These lecturers often have course assignments in other programmes, so that this number reflects only their contribution to the master of Bioinformatics programme.

According to the SER, there are **sufficient staff** to cover most teaching needs for core bioinformatics courses. Nevertheless, a need for additional lecturers in statistical bioinformatics is mentioned. Currently, 19 PhD students are available as teaching assistants. The SER signals – as a consequence of introducing more hands-on courses and project-based courses – an increasing need for teaching assistant support.

The SER does not mention **educational training** for the lecturers, but during the site visit it was indicated that all new staff members are obliged to follow a (much appreciated) class. Overall, the teachers are very helpful and it is easy to contact them. However, when interviewing the students, the assessment panel still received a somewhat mixed opinion on **class preparation** and **availability** of some of the teaching staff, especially when team teaching is involved. The panel notes that team teaching is not interpreted as joint teaching, but as each lecturer individually teaching particular subjects within one course. As a result, Lecturers do not always seem aware of the teaching of their colleagues. In a recent meeting with alumni, it was stressed that team teaching courses are not very well structured ('the overall view is not always clear') and that the different teachers should take into account the content of the courses of their colleagues. The panel therefore recommends that attention should be paid in the professionalisation policy to the promotion of quality team teaching.

The **intake policy** is transparent. For students holding a bachelor's degree from KU Leuven, a list of admissible degrees is provided. For Belgian students from outside KU Leuven, admission is granted upon evaluation by the POC. For international students, the International Office of KU Leuven receives applications. If acceptable, the credentials are further evaluated by the programme director and programme secretary. Specifically competencies in biology, ICT and mathematics, but also English proficiency, are carefully

checked. The number of programme starters is rather constant and fluctuates around every year. About 40% of the students are Belgian (Flemish), while the remainder mostly come from Asia, Africa and the rest of Europe. According to the SER, the selection of international students has become 'more stringent' during recent years, to make their level 'directly comparable to that of the local students'. This was a necessary step, as it turned out that international students performed worse than Belgian students. As a matter of fact, a number of problems were reported concerning the poor background in mathematics and statistics for some of the foreign students. While the first results of the stricter criteria are encouraging, the programme management are thinking about an online multiple-choice test, in order to assess for all candidates the courses for which they have an appropriate background.

Given its mixed student population, internationalisation of the programme is principally considered as 'inbound'. Some students do carry out their master's thesis abroad. At the time of the assessment, an Erasmus convention with Linköping University had been set up to arrange a systematic exchange of students. The panel advises the programme management to consider agreements with other universities such as Cape Town University or China Agricultural University.

With regard to student support, the SER mentions the availability of a study advice service, social services, a psychotherapeutic centre and a faculty study trajectory counsellor. The programme also relies heavily on the dedication of its programme secretary. Given that the number of students is still manageable, the programme secretary functions as a daily contact point for all students. In September a welcome session for first- and second -year students is organised. Primarily for international students, a system of personal buddies has been set up: someone in the second phase will be the mentor of an incoming student and can help him or her with practical issues.

The assessment panel is satisfied with the quality of student facilities. Students have not mentioned particular complaints regarding the study load of the programme, although the SER mentions a 'high workload', as well as the existence of 'adjustment issues' for foreign students and 'concerns' regarding the number of drop-outs.

Lectures are organised at the Arenberg Campus in Heverlee, a part of Leuven. All classrooms are well equipped. However, because computing

requirements in bioinformatics have grown explosively in the last few years, there is a need for computing servers that are capable of handling student exercise sections requiring significant computer power. At the time of the site visit, the programme was finalising a structural solution.

The SER is lacking some essential information, such as results of student evaluations and a follow-up list from the previous assessment (2006). Notwithstanding this, many issues have been satisfactorily addressed over the last 8 years. In 2013-2014, a reformed and adapted programme was introduced, strongly based on interviews with recently graduated students and alumni. It is obvious that an ambitious programme-in-transition like the Master in Bioinformatics involves unavoidable 'start up diseases'. The assessment panel acknowledges this, and therefore stresses the importance of constant monitoring.

A key tool for the management and quality control of the programme are the weekly meetings between the programme director and the programme secretary. The student representatives are invited to participate in these meetings at their convenience whenever they have issues that need addressing.

A Permanent Educational Committee (POC) deals with (among other things) feedback on the programme. It consists of lecturers from the four organising faculties, 4 student representatives and 2 representatives of the teaching and research assistants. Since 2013-2014, the POC has also welcomed a representative of the professional field. Based on its interviews and the POC reports the panel read during the site visit, it is clear that the POC is quite active and promptly addresses the problems that students bring forward. However, some problems have been signalled to the assessment panel that were detected neither during POC meetings nor in the course evaluations. As these issues have mainly to do with teaching quality (see supra), it might be a hard step for (international) students to bring this forward and 'criticise' their teachers. The panel recommends that more ad hoc feedback should be gathered from the students, apart from the periodic course evaluations – but with the same degree of anonymity.

In conclusion, the panel appreciates the coherence of the programme of the Dutch and English Science specialisation and the good variety in teaching methods. A point of concern is the quality and added value of team teaching. Topics such as ethics, privacy and social implications deserve more attention. The panel found insufficient generic quality

assurances in the Dutch and English Bioscience Engineering and Engineering specialisation to assess the educational process of these variants positively. The content and design of the programme of these majors offer insufficient guarantees that students achieve the required learning outcomes.The programme management should do some serious work to develop a clear package of learning content and learning activities related to the engineering competencies. The current interpretation of the master's thesis, given the objectives and contents as described in the ECTS files, offers insufficient guarantees that students are able to acquire the necessary engineering competencies.

Generic quality standard 3 - Outcome Level Achieved

The assessment panel evaluates the outcome level of the Dutch and English Science specialisation as satisfactory.

The assessment panel evaluates the outcome level of the Dutch and English Bioscience Engineering specialisation as unsatisfactory

The assessment panel evaluates the outcome level of the Dutch and English Engineering specialisation as unsatisfactory

The programme management makes use of a clear, well described **evaluation policy**. Attention is given to the alignment of the evaluations with the learning outcomes. At 42%, the oral exam is the most used evaluation form. Besides this format, other evaluation forms such as written exams (32%), presentations (16%) and self- assessment/peer assessment (10%) are organised throughout the programme.

In the first lecture, the lecturer informs the students of how the evaluation will take place. During POC meetings, the importance of having clear **assessment criteria** is stressed. Through lectures and workshops, organised by the faculty, lecturers are made aware of how to organise high quality evaluations. The panel has viewed a selection of exam questions and finds their quality satisfactory, focusing on assessing knowledge and insight. At a recent alumni meeting with the programme management, it was pointed out that evaluations test the competences, although for some students it was hard to distinguish what competence was acquired from the current programme and what was obtained from previous studies.

For every course where homework and papers have to be produced, it is expected that students will receive intermediate **feedback**. All lecturers

also need to provide at least one contact moment after deliberation so that students can look at their exam and receive feedback. According to the SER, only a few students make use of this possibility.

As for the **master's thesis**, there are clear evaluation criteria that are outlined in a detailed assessment form. The panel has read a sample of 10 recently written master's theses. The quality of the theses of the Dutch and English science specialisation is good. The theses of the Dutch and English engineering and bio-engineering major shows to little engineering competences. Also, the panel notes that no distinction is made in the assessment between the theses in the various majors. As a result there are insufficient guarantees that within the English and Dutch engineering and bio-engineering majors the assessment and testing of the students is valid and reliable. The panel considers it necessary for the theses in these majors to be assessed against specific criteria so that there are assurances that students have achieved the necessary engineering competencies.

Every December a career event and a PhD event are organised. No further information is provided in the SER regarding **employability**, however. During the site visit the assessment panel learned that not all students are well aware of their career perspectives, often thinking that a PhD is the only outlet. At a meeting organised by the programme management, alumni expressed their opinion that it is 'very difficult' to find a good job without a PhD. The alumni that were interviewed by the panel had a more nuanced vision, underlining that the programme provides the right background and methodology to succeed in a wider range of (non-research related) jobs. As a matter of fact, during the whole programme the contact with the professional field is very limited. The programme management states for instance that the 'practical organisation' for inviting guest-speakers from industry is rather difficult.

The **study efficiency** fluctuates between 63% and 79%.The time-to-graduation table shows that nearly all students who obtain their diploma succeed in doing this within two years. These are obviously satisfactory results.

In conclusion, the panel is satisfied with the evaluation policy used by the programme in the Dutch and English Science specialisation. The quality of the master's theses is good. The panel found insufficient quality guarantees regarding the English and Dutch engineering and bio-engineering majors. The panel considers it necessary for the theses in these majors to be

assessed against specific criteria so that there are assurances that students have achieved the necessary engineering competencies. A general point of attention is the lack of information regarding employability, as well as the limited contacts with the professional field.

Final judgment of the assessment panel

Dutch and English Science specialisation

Generic quality standard 1 – Targeted Outcome Level	S
Generic quality standard 2 – Learning Process	S
Generic quality standard 3 – Outcome Level Achieved	S

As Generic quality standard 1 is evaluated as satisfactory, Generic quality standard 2 is evaluated as satisfactory and Generic quality standard 3 is evaluated as satisfactory, the final judgement of the assessment panel about the Master of Science Biomolecular Sciences is satisfactory, according to the decision rules.

Dutch and English Bioscience Engineering specialisation

Generic quality standard 1 – Targeted Outcome Level	S
Generic quality standard 2 – Learning Process	U
Generic quality standard 3 – Outcome Level Achieved	U

As Generic quality standard 1 is evaluated as satisfactory, Generic quality standard 2 is evaluated as unsatisfactory and Generic quality standard 3 is evaluated as unsatisfactory, the final judgement of the assessment panel about the Master of Science Biomolecular Sciences is satisfactory for a limited period, according to the decision rules.

Dutch and English Engineering specialisation

Generic quality standard 1 – Targeted Outcome Level	S
Generic quality standard 2 – Learning Process	U
Generic quality standard 3 – Outcome Level Achieved	U

As Generic quality standard 1 is evaluated as satisfactory, Generic quality standard 2 is evaluated as unsatisfactory and Generic quality standard 3 is evaluated as unsatisfactory, the final judgement of the assessment panel about the Master of Science Biomolecular Sciences is satisfactory for a limited period, according to the decision rules.

Summary of the recommendations for further improvement of the study programme

Generic quality standard 1 – Targeted Outcome Level

- Utilise the benchmarking exercise for reflection on content, course organisation and gaps in the curriculum.
- Include a learning objective that addresses the training of ethics and scientific integrity.

Generic quality standard 2 – Learning Process

- Guarantee enough alternative courses for students following the engineering tracks.
- Make topics such as ethics, privacy and social implications more visible in the programme.
- Guarantee extra guidance for students writing a master's thesis in a domain they are not familiar with.
- Evaluate team teaching for organisational issues and content, structure, connectivity, overlap of courses.
- Initiate an inquiry about the utilisation of MOOCs.
- Gather more ad hoc feedback from the students concerning the quality of the programme, guaranteeing constant monitoring.

Generic quality standard 3 – Outcome Level Achieved

- Inform students better about their career perspectives, for instance by improving contacts with the professional field.

KU LEUVEN & UNIVERSITEIT GENT
Master of Science in Food Technology

SUMMARY
Master of Science in Food Technology
KU Leuven and Ghent University

From 12 to 15 May 2014, the Master of Science in Food Technology at KU Leuven and UGent has been evaluated in the framework of an educational assessment by a peer review panel of independent experts. In this summary which describes a snapshot, the main findings of the panel are listed.

Profile of the programme

The overall objective of the programme is to provide multi-disciplinary and specialised professional training in food technology, with the emphasis on postharvest and food preservation engineering on the one hand and food science and technology on the other, to equip future personnel with the technical and managerial knowledge, skills and attitudes which they require to contribute successfully to solving problems related to food security through the production of safe foods of high quality.

Programme

The programme counts 120 ECTS and consists of two years. The first stage comprises 60 ECTS and is common to all students. The first stage courses, all compulsory, aim to provide an in-depth education in food science as well as engineering and food engineering.

In the second stage of the programme, students have to choose between two majors: Postharvest and Food Preservation Engineering or Food Science and Technology. The remaining credits consist of optional courses and the thesis research. The major, the optional courses and the thesis topic are chosen at the end of the second semester of the first stage. Logistically, the first semester courses are organised at Ghent University, while the second semester takes place at KU Leuven. The second stage courses of the majors Postharvest and Food Preservation Engineering are taught at KU Leuven, while the courses of the major Food Science and Technology are taught at the UGent. At both universities, optional courses and thesis research topics are offered.

The first stage focuses on (applying) knowledge and understanding. Teaching methods here mainly consist of lectures, interactive lectures, as well as examples shown during lectures supplemented with laboratory work and exercises. During the second stage, approximately 25% of the staff use teaching methods involving (interactive) lectures and examples, while another 25% refer to teaching methods including laboratory work, tutorials, workshops, invited speakers and company visits. About half of the activities are related to the master's thesis.

Evaluation and testing

The first stage of the programme is evaluated mainly through written exams (44%), oral exams with written preparation (34%) and practical exams (15%). Written exams mainly take place during the first semester at UGent, while the oral exams with written preparation mainly take place during the second semester at KU Leuven.

The evaluation of the second stage consists of 50% master's thesis evaluation, ca. 30% oral and written exams and ca. 20% other evaluation methods (practical exam, papers, report, presentation, self and peer assessment). The master's thesis has to be defended in public.

Services and student guidance

The secretariat (located at KU Leuven and UGent) is the direct contact point for students and teaching staff. Both at KU Leuven and UGent, an ombudsperson (also called the programme mentor) is available for the students to deal with any type of conflict that may arise related to educational matters and examinations.

At the end of the first semester, specific help is offered to transfer first stage students (and their luggage) from Ghent to Leuven. During the second semester, an information session is organised for the first stage students in order to inform them about the study programme of the second stage (including the master's thesis research topics).

During their studies, students make use of the infrastructure and facilities of KU Leuven and UGent. Both universities offer teaching and research facilities at their campuses of location. Lectures, numerical exercises, tutorials and practicals take place in lecture rooms, practical laboratories and research laboratories. The master's thesis research takes place in the research laboratories of the promoters.

Study success and professional opportunities

Of the students successfully completing the programme, 87% graduate after 2 years, 7% need 2.5 years (i.e. one extra semester) and 6% need 3 years. There is an increasing tendency to extend the study time over more than 2 years, in particular for students who are attending the programme using their own funds.

The success ratio for students with a background in food science/technology/engineering is higher than for those with a non-food engineering background, and the lowest for those with a non-food-oriented sciences background.

Almost all alumni return to their home country, in a number of cases after further PhD studies. The group of PhD students mainly ends up in academic institutions. A large proportion of the alumni (75%) is involved in education, research and service in academic institutes, research institutes and governmental institutions.

ASSESSMENT REPORT
Master of Science in Food Technology
KU Leuven and Ghent University

Preface

This report concerns the Master of Science in Food Technology, an interuniversity programme organised by the Universiteit Gent (UGent) and Katholieke Universiteit Leuven (KU Leuven). The assessment panel visited the study programme from 12 to 15 May 2014.

The panel assesses the study programme on the basis of the three generic quality standards (GQSs) of the VLUHR programme assessment framework. This framework is designed to fulfil the accreditation requirements set by the NVAO. For each generic quality standard, the panel gives a weighted and motivated judgement on a four -point scale: unsatisfactory, satisfactory, good or excellent. In the assessment of generic quality assurance, the concept of 'generic quality' indicates that the GQS is in place and that the programme – or a specific mode of the programme – meets the quality level that can reasonably be expected, from an international perspective, of a Master's programme in higher education. The score 'satisfactory' indicates that the programme meets the generic quality because it demonstrates an acceptable level for the particular GQS. If the study programme scores 'good', the programme systematically exceeds the generic quality for that standard. If the programme scores 'excellent', it achieves well above the generic quality for the particular GQS and serves as an (inter)national example. The score 'unsatisfactory' indicates that the programme does not attain the generic quality for that particular GQS.

The panel's opinions are supported by facts and analyses. The panel makes clear how it has reached its opinion. The panel also expresses a final opinion on the quality of the programme as a whole, also according to the same four-point scale. Judgements and recommendations relate to the programme with all subordinate modes or majors, unless stated differently.

The panel assesses the quality of the programmes as it has been established at the time of the site visit. For each programme, the panel has based its judgement on the self-evaluation report and the information that arose from the interviews with the programme management, lecturers, students, alumni and personnel responsible at programme level for internal quality assurance, internationalization, study guidance and student tutoring. The

panel has also examined the course materials, master's theses, test and evaluation assignments and standard answering formats, and numerous relevant reports available. For the student success rate, the panel has relied on data provided by the programme management.

In addition to its judgement, the panel also formulates recommendations with respect to quality improvement. In this manner, the panel wants to help improve the quality of the programme. The recommendations are included in the relevant sections of the respective generic quality standards. At the end of the report an overview is given of improvement suggestions.

Context of the study programme

The Master of Science in Food Technology consists of 120 ECTS credits, spread over two years. The programme (all variants) has 35 students enrolled at KU Leuven and 31 at the Universiteit Gent (2012–2013). The programme is an interuniversity programme embedded in the Faculty of Bioscience Engineering of KU Leuven and the faculty of Bioscience Engineering of the Universiteit Gent (UGent). The faculties are also responsible for numerous master's programmes in the field of Bioscience and Bio-engineering.

The Master of science in Food Technology (IUPFOOD) can trace its origin to two independent but simultaneouslysubmitted proposals to VLIR-UOS in the early 1990s. At the suggestion of VLIR-UOS, and after detailed consultation with the proposers, an integrated study programme was formulated. The programme started up in the 1993–1994 academic year; the first MSc degrees were awarded in 1994–1995. In this initial study programme, each partner (KU Leuven and UGent) offered a separate degree. At that time, the integration consisted of a first semester common to both study programmes. Following the 2000–2001 VLIR-UOS-initiated evaluation and based on the suggestions of the evaluation committee, the programme was completely revised (as of academic year 2002–2003) into a more integrated structure, strengthening the interuniversity character of the programme and delivering a single interuniversity MSc degree 'Master of Science in Food Technology' with two majors ('Postharvest and Food Preservation Engineering' and 'Food Science and Technology').

The master of science in Food Technology, being one of the VLIR-UOS -supported international programmes, receives financial support from

VLIR-UOS in the form of scholarships awarded to students from the South (students coming from low-income countries listed by VLIR-UOS) and a working budget to support the programme.

The programme is organised under the supervision of the two participating universities, KU Leuven and UGent. The organisation and management structure of the programme, including financial aspects, is detailed in a specific agreement. The agreement between KU Leuven and UGent further stipulates financial aspects and overall aspects of student administration. The programme is managed by the steering committee, consisting of two members of each participating university. The steering committee is responsible for the general management of the programme. The education committee, consisting of all academic staff as well as a delegation of assistant teaching personnel and a delegation of students, advises the University Boards. It meets a least once a year. Daily organisation is carried out by the programme director, the programme mentor and the administrative staff. The Daily Organisation committee handles all programme-related matters for all stakeholders involved. It meets once every two months, or more frequently when required.

Starting from the 2008–2009 academic year, students entering the programme in a particular academic year all register at the same university (alternating between KU Leuven and UGent, starting with KU Leuven in the 2008–2009 academic year) and all administrative aspects with regard to that student, until the moment of graduation, are handled by the university of initial registration.

Generic quality standard 1 - Targeted Outcome Level

The assessment panel evaluates the targeted outcome level as satisfactory

The overall objective of the programme is to provide **multi-disciplinary and specialised professional training** in food technology, with the emphasis on postharvest and food preservation engineering on the one hand and food science and technology on the other, to equip future personnel with the technical and managerial knowledge, skills and attitudes which they require to contribute successfully to solving problems related to food security through the production of safe foods of high quality. Two technological dimensions of prime and crucial importance in food processing and preservation are the key objectives and programme options: 1) the role of postharvest and food preservation unit

operations in delivering safe and nutritious foods to the end consumer; 2) the transformation of raw materials into products suitable for human consumption or into intermediate ingredients for further use in the food industry. These two concerns are directly translated into the **focus points** of the programme.

The considerations sketched above have been and are being stressed by various international organisations, including the World Health Organisation and the International Union of Food Science and Technology, and in many Country Strategy Documents from the South. Because of the specific relevance to students from the South, VLIR-UOS supports (in terms of student scholarships and an organisational support budget) the master of science in Food Technology as one of its International Course Programmes (ICPs).

The profile has recently (in parallel with the preparation of the SER) been translated into **14 programme-specific learning outcomes**. The main argument for not distinguishing between **domain-specific learning outcomes** and programme-specific learning outcomes is the fact that the Master of Science in Food Technology programme is the only food technology programme available in Flanders oriented towards international students with a diverse background, including an emphasis on needs in the South. This means that the programme learning outcomes comply with the Flemish qualification framework and – evidently – with the domain-specific learning outcomes. According to the SER, this exercise offered 'an opportunity to revise the objectives of the programme', as well as creating 'an improved balanced set of learning outcomes emphasising all dimensions of the programme'. In formulating the new programme-specific learning outcomes, it was decided to remain **somewhat generic**, to allow for flexibility in the programme over a longer time frame. In this context, the programme structure – with two majors integrated within a single final degree – is built around a number of common generic learning outcomes on the one hand and common specific learning outcomes on the other hand. In the previous visit of 2006, it was pointed out that a 'business-oriented component' should also be involved in the learning outcomes. This concern has been included in one of the current learning outcomes. The panel appreciates this, but would still like more involvement of the **professional field** itself in the reflection on the learning outcomes.

The programme-specific learning outcomes were presented to 41 alumni active in the field of food technology. All respondents (27 alumni – all

PhD) stressed that the learning outcomes covered the requirements of the vocational field. According to the SER, 'students and recent alumni as well as teaching staff indicated that the learning outcomes are clearly stated'. According to the SER, the programme targets are in accordance with various international organisations, including the WHO and the International Union of Food Science and Technology, and with many Country Strategy Documents from the South. It is further stated that the learning outcomes include the four levels found in many international food science/technology/engineering programmes. The panel values this **comparison with international programmes**, but would have liked a deeper reflection on similarities and differences. Further, the panel would like to see the professional field more involved in the reflection on the learning outcomes through representatives other than alumni. The panel recommends the organisation of structural and sustainable involvement of the professional field in the monitoring and evaluation of the learning outcomes.

In conclusion, the panel finds that the programme learning outcomes comply with all formal requirements. The collaboration between two universities is an asset. The learning objectives, while remaining somewhat generic, focus on multidisciplinarity and specialised professional training. more profound international benchmarking and stronger involvement of the professional field are recommended.

Generic quality standard 2 - Learning Process

The assessment panel evaluates the learning process as good

The programme consists of 120 ECTS. The **first stage** comprises 60 ECTS and is common to all students. The first stage courses, all compulsory, aim to provide an in-depth education in food science (26 ECTS) as well as engineering and food engineering (34 ECTS). The lectures are intended to take the different backgrounds of the students into account. In the **second stage** of the programme, worth 60 ECTS, students have to choose between two majors: Postharvest and Food Preservation Engineering or Food Science and Technology. Each major counts 18 ECTS. The remaining credits consist of optional courses (12 ECTS) and the thesis research (30 ECTS). The major, the optional courses and the thesis topic are chosen at the end of the second semester of the first stage. For the optional courses, the student can choose among the courses of the other major and the additional courses offered. Logistically, the first semester courses are organised at Ghent University, while the second semester takes place at

KU Leuven. The second stage courses of the majors Postharvest and Food Preservation Engineering are taught at KU Leuven, while the courses of the major Food Science and Technology are taught at the UGent. At both universities, optional courses and thesis research topics are offered.

When allocating the courses over the two stages, two principles were taken into account: (i) the implementation of continuous learning lines and (ii) a balanced distribution over the different semesters. In the second stage of the programme, a distinction is made between 'horizontal' and 'vertical' courses. Horizontal courses refer to courses that are relevant to and can be applied to different product groups in different environments (different stages of the food chain). Vertical courses refer to specific food product or raw material-oriented application fields. The compulsory character of horizontal courses is more pronounced than for vertical courses. According to the surveys organised by the programme management, students and teaching staff consider the curriculum to be **very coherent**. Although some overlap exists and is noticed, students and teaching staff do not consider this a problem.

The first stage focuses on (applying) knowledge and understanding. **teaching methods** here mainly consist of lectures, interactive lectures, as well as examples shown during lectures supplemented with laboratory work and exercises. Workshop activities, lectures by invited speakers and company visits represent a limited share in the programme. During the second stage, approximately 25% of the staff use teaching methods involving (interactive) lectures and examples, while another 25% refer to teaching methods including laboratory work, tutorials, workshops, invited speakers and company visits. About half of the activities are related to the master's thesis. The assessment panel appreciates the overall variety in teaching methods.

The **master's thesis**, representing 30 ECTS, is a course that takes one academic year (over the two semesters). It is typically performed within a research group at KU Leuven or UGent. Topics must be chosen from a list, although it is theoretically possible for students to present their own proposal. However, students told the panel that their preference is not always 'realistic', as they have to find a promoter who is willing to support (scientifically and financially) their topic of interest. In practice the scope of topics remains – geographically speaking – limited. Students who want to write a thesis on a topic of their home country, regularly have to satisfy themselves with a second choice. According to the SER, only 'very few'

students make use of the opportunity of presenting their own topic of interest. The panel's interview with the teaching staff revealed a certain reluctance to allow students to write their thesis in the South, because the right equipment is not always available there. The panel understands this, but advises the programme management to encourage data collecting in the South. In the framework of the thesis, the student individually performs research work coached by one or more promoters and one or more assistants, and supported by technical personnel. The thesis comprises a literature review and an experimental part. In the literature review, the student must provide a clear overview of and insight into available relevant scientific literature. The experimental part comprises the design and execution of experiments under supervision. During the planning, execution and evaluation of experiments, intensive communication takes place between supervisor and student, allowing critical evaluation of the latter's autonomy and intellectual capacity. Overall, the **thesis guidance** is much praised by the students.

According to the assessment panel, the curriculum is a good reflection of the intended learning outcomes. The tailor-made curriculum gives the programme a **multi-disciplinary** character. Students called the programme, in this respect, quite 'eye opening'. Students especially appreciate the group work, as well as the fact that the study content is connected with applications and 'with real life'. The latter is certainly true for the major Food Science and Technology in Ghent, where they can attend a much-appreciated workshop on chocolate processing. As well as this students can take 'Workshop Food Technology' as an optional course in the second stage, a problem-solving case study in the field of food technology, with relevance to the students' countries of origin. Nevertheless, what students are still lacking is **direct contact with the work floor**. The SER itself admits that 'opportunities to present students with real-life/industrial-scale activities (e.g. company visits)' are 'underused' in the programme. Although company visits are still organised in different courses, the total number has decreased in last years. Some students are in favour of introducing an **internship**, which would enable them to see the whole production chain, not only on paper but through first-hand experience. The panel supports the idea of an elective course internship. The panels sees a lot of opportunities to cooperate with small- and large-scale Food technology companies in Flanders. The panel noted that following the self-evaluation report the programme management has taken the necessary action to organise company visits.

According to the SER, students experience the **study load** of the first semester (of the first year) as higher than that of the second semester. For the second stage, the study load is perceived as acceptable. In an alumni survey, the study load of the whole programme was judged by 60% as 'appropriate' and by 37.5% as 'difficult'. Overall, students find the programme quite 'intensive', as they mentioned in an interview with the panel. According to the programme managers, the effective study load is not too high, but this perception is mainly caused by the (sometimes difficult) **adaptation** of new students. Students confirmed to the panel that in the beginning they have to cope with an 'often very different educational system'. This does not mean that the initial welcome – at UGent – is not well organised. Incoming students are informed about all aspects of the programme and can ask for a Belgian or international master's student to act as a 'buddy' during their first week in Belgium. Before the start of the 2012–2013 academic year, a Summer School was organised for the first time by the UGent Faculty of Bioscience Engineering. The panel supports this initiative.

According to the SER, the **intake policy** is 'to recruit good/very good students with a relatively diverse academic background'. International applicants must have obtained an academic bachelor of science degree, in a discipline related to the content of the programme, from a recognised university, college or institute. Candidates are expected to have basic science training in at least three out of four of the following fields: (i) mathematics, statistics and physics, (ii) chemistry and biochemistry, (iii) biology and microbiology and (iv) engineering. They must have obtained their degree with an end result of at least upper second class or equivalent, and be fluent in English. The SER mentions a steady and stable **influx** of 25–35 students each year, and this is in line with the target of the programme. In overall terms, 53% of the students have a food-oriented bachelor degree, 37% a non-food-oriented bachelor degree in sciences and 10% a non-food engineering background. A small percentage of the incoming students have already obtained a master's degree. From a geographical point of view, the majority of students come from Africa and Asia. European students account for less than 10%. Having evaluated its own intake policy, the programme management intends to take a somewhat more critical approach to evaluating candidates with a non-food-oriented sciences background. The panel supports the continuous research to improve the intake procedures. According to the SER, the **drop-out rate** of the programme is about 9%. The panel appreciates the attention paid to the intake policy, including the analysis of drop-outs. The

panel wants to support the programme management in the initiatives it is taking to monitor and improve the quality of the intake.

Students obtaining a VLIR-UOS scholarship represent less than 50% of the total number of students attending the programme. The ICP character of the programme is reflected in the composition of students as well as in the curriculum. Food safety in developing countries is a recurrent topic in the programme. **Local capacity-building** has been a success at Can Tho University (Vietnam), where a collaborative programme has been set up with 16 alumni. The 2006 assessment panel recommended expanding the focus to cover more developing countries, but the programme management has not carried out more of these local capacity-building initiatives. It has ambitions to do so, but claims that it is hampered by the VLIR-UOS selection criteria. Nevertheless, there are still plans to repeat this action in Africa at Jomo Kenyatta University (Kenya). The panel appreciates the efforts of the programme management and wants to encourage it to take these actions further.

The programme management uses a combination of **academic staff** linked to the KU Leuven and to the UGent along with external experts in the South. Both at KU Leuven and at UGent, courses are taught by experts in specific subfields in food science, technology and engineering. In addition, expertise from related disciplines is used in basic engineering courses, statistics and management/economy-oriented courses. Most of the teaching staff have experience in the South and with international projects. assistance and support are also guaranteed during the programme. The number of senior academic staff (ZAP) involved in the programme is 29. Together with 2 post-doctoral assistants, they are responsible for lecturing on the different courses in the programme (including elective courses that are taken from other programmes at KU Leuven or UGent). The individual **teaching load** of the lecturers ranges from 1.5 to 14.5 ECTS per academic year. The lecturers are supported by 48 support staff (research assistants, post-doctoral assistants and associate academic staff outside the operating funds of the universities), mainly responsible for practical sessions, laboratory sessions, workshops and master's thesis research; 15 of them are involved in master's thesis research only. In the coming five years the programme will face the situation of a number of professors achieving emeritus status. According to the SER, there will be an evaluation of 'whether all fields of expertise can be maintained'. The panel considers it necessary to conduct a proactive human resource policy in short term to ensure the continuity of the programme.

The secretariat (located at KU Leuven and UGent) is the direct contact point for students and teaching staff. Overall, collaboration and day-to-day management are satisfactory for all involved. Both at KU Leuven and UGent, an **ombudsperson** (also called the programme mentor) is available for the students to deal with any type of conflict that may arise related to educational matters and examinations. At the end of the first semester, specific help is offered to transfer first stage students (and their luggage) from Ghent to Leuven. During the second semester, an information session is organised for the first stage students in order to inform them about the study programme of the second stage (including the master's thesis research topics).

Individual courses are taught by a team typically consisting of a single lecturer and support staff for laboratory exercises and/or tutorials or by a group of lecturers (multiple lecturers, further indicated as team teaching) and support staff. The principle of **team teaching** is used for courses requiring input from different fields of expertise. The SER mentions that students and teaching staff alike agree that team teaching offers added value to the programme, 'on condition that different fields of expertise can be effectively integrated in the course'. According to the teaching staff, this is not always the case. In the cases where the different fields of expertise cannot be effectively integrated in the course, 'team teaching should be critically reviewed'. The panel supports this recommendation, but also sees the need for professional development of the academic staff in order to optimise team teaching. Educational training is offered by the two participating universities. Courses for (starting) staff members are organised by the KU Leuven Teaching and Learning Department and the UGent Educational Quality Control Office. The three KU Leuven faculties of the Science Engineering and Technology Group organise thematic workshops at which lecturers share their educational experiences, but the participation of teachers is rather low and declining. In surveys organised by the programme, the **teaching quality** is highly valued. Students call the staff 'dedicated', 'approachable' and their teaching very interactive. Students are also satisfied with the fact that the teaching is very research -based.

During their studies, students make use of the **infrastructure and facilities** of KU Leuven and UGent. Both universities, and in particular their Faculties of Bioscience Engineering, offer teaching and research facilities at their campuses of location. Lectures, numerical exercises, tutorials and practicals take place in lecture rooms, practical laboratories and research laboratories. The master's thesis research takes place in the research

laboratories of the promoters, whether these are located at the faculties mentioned or elsewhere in the same university. At both locations, students have access to computer facilities. Electronic learning environments (Toledo at KU Leuven and Minerva at UGent) are available and used in different courses. Up-to-date electronic and physical library environments are available too. The results of the student and teaching staff survey show a high appreciation for infrastructure and facilities. Questions related to classrooms, ICT infrastructure, laboratories and library score quite well on average and no complaints have been made.

All lecturers, as well as a delegation of the assisting staff and of the students, are represented on an **Educational Committee**. This committee meets once a year 'or more frequently when required'. Although student involvement seems in this respect rather limited, no 'issues' were formulated by the students during the current site visit. The former assessment, in 2006, recommended the creation of an advisory board representing the professional field. The programme has decided not to comply, as it argues that alumni are closely involved in the surveys. The panel finds this regrettable and would again recommend the creation of an advisory board. This board could be a valuable tool for establishing cooperation with small- and large-scale Food technology companies for internships and monitoring and evaluating the programme-specific learning outcomes *(see GQS 1)*. Following the 2006 visit, **surveys** have been performed among students, alumni and teaching staff. Surveys targeting students (first and second stage) are organised as part of a continuous quality control system first implemented in 2002–2003. Surveys targeting alumni, students and teaching staff were specifically organised in the context of the preparation of the SER (2013). The results obtained from these surveys were presented to students and recently graduated alumni in a briefing and to the teaching staff during an open discussion. In the SER, the outcomes of all surveys, briefings and meetings are frequently used. The assessment panel is satisfied with the high quality of the SER.

As a matter of fact, a few recommendations by the previous assessment panel (in 2006) have not been implemented. When this is the case, the SER has made an effort to explain the reasons. In this context it might be mentioned that during the **previous assessment** the programme was rated so highly that the actions recommended by the 2006 panel were very demanding. Altogether, the current programme is based on twenty years of continuous experience and improvements and has now reached a mature stage.

In conclusion, the panel is satisfied by the quality of this programme. The programme succeeds in creating a qualitative learning environment. The curriculum well satisfies the overall objective of providing a multi-disciplinary and specialised professional training in food technology.

The programme is supported by high-quality staff that actively contribute to the active integration of the various forms of content.

Generic quality standard 3 - Outcome Level Achieved

The assessment panel evaluates the outcome level achieved as satisfactory

The Faculties of Bioscience Engineering at KU Leuven and UGent have each formulated their **assessing**, **testing** and **examining policy**. The programme has also drafted a proper vision, embedded in the policies of both universities, respecting the general principles formulated at KU Leuven and UGent. A single **Board of Examiners** evaluates the overall study result obtained by the students. After each examination period (at the end of each semester and a third retake period), the Daily Organisation Committee, in interaction with the Educational Committee, critically reviews the overall exam results of each course, as well as the overall exam results obtained by the students for the programme as a whole. The individual teaching staff members have a key responsibility in guaranteeing the **validity and reliability** of evaluation and testing. At the KU Leuven Faculty of Bioscience Engineering, a number of specific actions have been or are being undertaken to help teaching staff in this respect. At the UGent Faculty of Bioscience Engineering, a checklist including the evaluation, pursuing and securing of quality parameters has been composed and was introduced to the different educational committees in January 2014.

The evaluation of a course unit is often a combination of different **evaluation methods**. The first stage of the programme is evaluated mainly through written exams (44%), oral exams with written preparation (34%) and practical exams (15%). Written exams mainly take place during the first semester at UGent, while the oral exams with written preparation mainly take place during the second semester at KU Leuven. The evaluation of the second stage consists of 50% master's thesis evaluation, ca. 30% oral and written exams and ca. 20% other evaluation methods (practical exam, papers, report, presentation, self and peer assessment). Generally, oral and written exams take place during the exam period.

Practical exams and evaluation of papers, reports and presentations usually take place outside the exam period. Overall, there is a good **variety** in evaluation methods and they are in line with the programme learning outcomes. The panel has viewed a selection of exam questions and finds their quality satisfactory. The panel noted that not all courses with team teaching are evaluated with an integrated exam. The panel considers it evident in such cases that the exam should be prepared by the entire team and considers it necessary to establish this at short notice. Not only are evaluation methods described in detail in the ECTS forms of each course, but during the first and last lecture each lecturer also informs the students about his or her expectations. In order to familiarise the students with the examination system (format, approach, etc.), interim tests for some course units are organised during the first stage. All surveys by the programme management as well as the interviews by the assessment panel point to the same conclusion: students are **clearly informed** about the format of the exams. the panel was also surprised to hear that students quite like oral examinations, in spite of being completely new to them in most cases.

Following the interim tests in the first stage of the programme, students receive overall **feedback** during the next course lecture. At the end of an oral exam, the majority of the lecturers give individual feedback. For all exams – no matter what evaluation method is used – students have the opportunity of receiving individual feedback. Only a limited number of students make use of this. The committee would recommend that the programme management should develop a more proactive feedback policy to tackle the rather low usage of the feedback possibilities.

The **master's thesis** is defended in public. The thesis defence consists of a presentation by the student, followed by a discussion with the jury members. During the discussion, the student is questioned on the content of the written document and the oral presentation. All panel members have read a sample of 12 recently written master's theses. The quality of these master's theses is quite good, and consistent with the assigned grades. The master's thesis defence and evaluation follow a different administrative process for the two majors. Among the differences is the use of a special evaluation template at KU Leuven, not in use at UGent. The panel considers it essential that all students are assessed equally. Therefore, the panel recommends to implement a uniform assessment form.

Of the students successfully completing the programme, 87% graduate after 2 years, 7% need 2.5 years (i.e. one extra semester) and 6% need

3 years. The SER mentions an increasing tendency **to extend the study time** over more than 2 years, in particular for students who are attending the programme using their own funds. Of the 33 students who started in 2011–2012, 22 students graduated after 2 years. The SER signals that the success ratio for students with a background in food science/technology/engineering is higher than for those with a non-food engineering background, and the lowest for those with a non-food-oriented sciences background.

The programme management has conducted a survey among graduates from the period 2004–2011. The alumni who responded agree that the programme has prepared them very well for the job market as well as for further advanced studies (e.g. PhD). They judge the programme to be very important for **their career, their employer and their country**. According to the same survey, almost all alumni return to their home country, in a number of cases after further PhD studies. The group of PhD students mainly ends up in academic institutions. A large proportion of the alumni (75%) is finally involved in education, research and service in academic institutes, research institutes and governmental institutions. Looking at earlier generations of alumni, there are many examples of past students who are professors, heads of departments, vice-deans and deans in the field of food technology at universities, key senior researchers at research institutes, key experts in governmental institutions (food agencies, bureaus of standards) and key senior executives in the private sector. Given such good results regarding **employability**, the panel suggests that alumni in food industries and research facilities should return more frequently to Belgium, in order to create more sustainable networks.

In conclusion, the panel is confident of the validity, reliability and transparency of the assessment policy. The programme management must implement a uniform assessment form for the master's thesis to ensure an equivalent assessment of all students. There is a need to develop a more proactive feedback policy to tackle the rather low usage of the formal feedback possibilities.

Final judgement of the assessment panel

Generic quality standard 1 – Targeted Outcome Level	S
Generic quality standard 2 – Learning Process	G
Generic quality standard 3 – Outcome Level Achieved	S

As Generic quality standard 1 is evaluated as satisfactory, Generic quality standard 2 is evaluated as good and Generic quality standard 3 is evaluated as satisfactory, the final judgement of the assessment panel about the Master of Science in Food Technology is satisfactory, according to the decision rules.

Summary of the recommendations for further improvement of the study programme

Generic quality standard 1 – Targeted Outcome Level

- Involve the professional field more in the reflection on the learning outcomes through representatives other than alumni

Generic quality standard 2 – Learning Process

- Encourage data collecting in the South for the master thesis
- Encourage professional development of the academic staff in order to optimise team teaching.

Generic quality standard 3 – Outcome Level Achieved

- Create at short notice integrated exam by the entire team when there is team teaching.
- Develop a more proactive feedback policy to tackle the rather low usage of the feedback possibilities
- Implement a uniform assessment form for all students, regardless of their major. Make the link with the intended learning outcomes, have clear assessment criteria and provide the opportunity for qualitative feedback to students.

UNIVERSITEIT GENT & VRIJE UNIVERSITEIT BRUSSEL
Master of Science in Physical Land Resources

SUMMARY
Master of Science in Physical Land Resources
Universiteit Gent & Vrije Universiteit Brussel

From 13 to 15 May 2014, the Master of Science in Physical Land Resources at UGent-VUB has been evaluated in the framework of an educational assessment by a peer review panel of independent experts. In this summary which describes a snapshot, the main findings of the panel are listed.

Profile of the programme

The Master of Science in Physical Land Resources is organised at both UGent and VUB and aims to contribute to an increased knowledge in Physical Land Resources, both in terms of quantity (more experts with a broad knowledge) and in terms of quality (knowledge and its use at an advanced scientific level).

Special attention is given to analysing problems in developing countries and problem-solving under sub-optimal conditions. In all course units attention is therefore given not only to the latest technological developments and equipment, but also to alternatives and design of low-tech solutions that encourage self-reliance in developing countries.

Programme

The programme counts 120 ECTS and consists of two years. The programme has a broad basis of introductory courses, supporting land resources engineering and soil science. The courses are strongly oriented towards the situation and problems in developing countries. The programme as a whole addresses all parties that are interested in soil and soil science for various reasons. The common core of the programme provides the basic knowledge that is fundamental to all parties concerned. The in-depth specialised knowledge provided in the Soil Science major is strongly oriented towards agronomists and soil scientists, while geologists and civil engineers find the specialised training they need in the Land Resources Engineering major. There are nine compulsory courses offered in the first year, which form the common core of both main majors. The remaining three courses in the first year, as well as all courses in the second year are major-specific and specialised.

A wide variety of teaching methods is used. All course units (except for 'Internship' and 'Master Dissertation') include lectures. Lecturing represents 27% of all teaching methods. The number of teaching methods per course is 3 to 4. The following teaching methods are used in most of the course units: practical classes, PC-room classes and coached exercises. Independent work is used in 8 out of 32 course units. Field work and excursions are an important component of the programme. Teaching methods such as guided self-study, group work, demonstrations and microteaching are occasionally used.

Evaluation and testing

A combination of different evaluation methods is used. Permanent evaluations conducted throughout the semester are often used for exercises. The periodic first- and second-semester evaluations comprise the heaviest load of assessments. These evaluations can be oral or written, or a combination of both. Written exams count for 33%, reports for 21% and oral exams for 16%. Open book and oral examinations are particularly used for specialised courses. The master dissertation has to be defended in public.

Services and student guidance

The students receive all detailed information that is relevant for the programme upon their arrival, three weeks before the start of the summer

school preceding the lectures. General practical information on UGent and the city of Ghent is given at the Welcome Days organised by UGent for international students. As for the students from the Land Resources Engineering major, the International Relations and Mobility Office at VUB organises an 'orientation day' at the beginning of the academic year. Since September 2012 a summer school organised by the Faculty of Bioscience Engineering, before the start of the academic year, has offered a range of introductory courses with the aim of levelling out the heterogeneous intake of students. In November, a guided visit to all the labs involved in the programme is organised, both at UGent and at VUB, and offer the students a clear picture on possibilities for master dissertation subjects.

At UGent and VUB, the guidance on learning paths is organised at faculty level. Before the start of the second master's year, all students have to compose their curriculum by making a selection from the optional courses list. This is done electronically by the students themselves, but with advice and assistance from both the secretariat and the learning path counsellor. All curricula have to be approved by the learning path counsellor and by the course promoter of the respective faculties in consultation with the coordinators at UGent and VUB.

The programme is organised on four campuses: at the Faculty of Bioscience Engineering and the Faculty of Sciences of UGent for all general and specific courses of the Soil Science major in the first year, for all elective courses of the Soil Science major in the second year and for all first-year general courses of the Land Resources Engineering major; at the Faculty of Engineering of VUB for one specific first-year course of the Land Resources Engineering major and for all second-year elective courses of the Land Resources Engineering major; and at the Faculty of Engineering of ULB for one specific first-year course of the Land Resources Engineering major. All lecture rooms at all the involved campuses are provided with the necessary tools.

Study success and professional opportunities

Most of the students (between 80% and 95%) obtain the degree in two academic years. The remaining part needs one more semester or one more year, often to finalise their master dissertation.

Most of the students have relevant professional experience before taking up their studies. The great majority of alumni is employed in education/

training, public service/government or agriculture/agro-industry sector, primarily in their country of origin. For several graduates, their studies in Physical Land Resources have been a stepping stone to PhD studies in Belgium or abroad.

ASSESSMENT REPORT
Master of Science in Physical Land Resources
Universiteit Gent & Vrije Universiteit Brussel

Preface

This report concerns the Master of Science in Physical Land Resources organised jointly by Ghent University (UGent) and Vrije Universiteit Brussel (VUB). The assessment panel (further referred to as the panel) visited the study programme during its visit to UGent from the 13th to the 15th of May 2014.

The panel assesses the study programme on the basis of the three generic quality standards (GQSs) of the VLUHR programme assessment framework. This framework is designed to fulfil the accreditation requirements set by the NVAO. For each generic quality standard, the panel gives a weighted and motivated judgement on a four -point scale: unsatisfactory, satisfactory, good or excellent. In the assessment of generic quality assurance, the concept of 'generic quality' indicates that the GQS is in place and that the programme – or a specific mode of the programme – meets the quality level that can reasonably be expected, from an international perspective, of a Master's programme in higher education. The score 'satisfactory' indicates that the programme meets the generic quality because it demonstrates an acceptable level for the particular GQS. If the study programme scores 'good', the programme systematically exceeds the generic quality for that standard. If the programme scores 'excellent', it achieves well above the generic quality for the particular GQS and serves as an (inter)national example. The score 'unsatisfactory' indicates that the programme does not attain the generic quality for that particular GQS.

The panel's opinions are supported by facts and analyses. The panel makes clear how it has reached its opinion. The panel also expresses a final opinion on the quality of the programme as a whole, also according to the same four-point scale. Judgements and recommendations relate to the programme with all subordinate modes or majors, unless stated differently.

The panel assesses the quality of the programme as it has been established at the time of the site visit. The panel has based its judgement on the self-evaluation report and the information that arose from the interviews with the programme management, lecturers, students, alumni and personnel responsible at programme level for internal quality assurance,

internationalisation, study guidance and student tutoring. The panel has also examined the course materials, Master's theses, test and evaluation assignments and standard answering formats, and numerous relevant reports available. For the student success rate, the panel has relied on the data provided by the programme management. The panel has also visited specific educational facilities such as classrooms, laboratories, experimental facilities and libraries during the site visit at the various universities.

In addition to its judgement, the panel also formulates recommendations with respect to quality improvement. In this manner, the panel wants to help improve the quality of the programme. The recommendations are included in the relevant sections of the respective generic quality standards. At the end of the report an overview is given of improvement suggestions.

Context of the study programme

The Master of Science in Physical Land Resources consists of 120 ECTS credits, spread over two years. The programme (all variants) has 37 students enrolled (2012–2013). The programme is jointly organised by Ghent University (Faculty of Bioscience Engineering) and Vrije Universiteit Brussel (Faculty of Science and Bioscience Engineering).

The programme in Physical Land Resources (PLR) took root in the Programmes in Soil Science and in Eremology, both organised at UGent. The objectives of both programmes were combined and updated in the present programme. The programme in Physical Land Resources has preserved the spirit of its 'parent programmes', and has kept its focus on developing countries. Through the co-operation with VUB, the scope has widened from fundamental soil science and soil science applied to agriculture, to non-agricultural applications of soil science. The programme originally provided a common core of courses that formed a fundamental basis in physical land resources, after which the participants could choose among three main subjects : "Analysis of Physical Land Resources", "Management of Physical Land Resources", and "Use of Physical Land Resources". Since 2007, when the regular master's programmes resulting from the Bachelor-Master transformation were set up, participants have received a Master of Science degree on successfully the entire programme.

The Physical Land Resources programme is assisted by three commissions: the Commission on Programmes (OC-PLR), the Examination Commission

(EC-PLR) and the Steering Committee (SC-PLR). The Commission on Programmes Physical Land Resources (OC-PLR) consists of 9 teaching staff members (6 from UGent and 3 from VUB), 3 assistant academic staff members (2 from UGent and 1 from VUB), and 6 students (3 students from the Soil Science major and 3 from the Land Resources Engineering major). The Examination Commission (EC-PLR) comprises all lecturers involved in the programme. The Steering Committee (SC-PLR) consists of 3 teaching staff members (2 from UGent from both faculties and 1 from VUB), and the UGent coordinator of the PLR programme of UGent. Furthermore, at UGent the PLR programme is directly represented on the Faculty Council of the Faculty of Sciences (FS) and indirectly represented on the Faculty Council of the Faculty of Bioscience Engineering (FBE) through the Commission on Programmes on Applied Biological Sciences (OC-ABS), in which all English master's programmes which are administratively organised at FBE are represented. At VUB the PLR programme is represented on the Faculty Board of Education and in the Faculty Council of the Faculty of Engineering by the programme coordinator.

Generic quality standard 1 - Targeted Outcome Level

The assessment panel evaluates the targeted outcome level for the Master of Science in Physical Land Resources as good

The Master of Science in Physical Land Resources is organised at both UGent and VUB and aims to contribute to an increased knowledge in Physical Land Resources, both in terms of quantity (more experts with a broad knowledge) and in terms of quality (knowledge and its use at an advanced scientific level). The programme-specific learning outcomes comply with the requirements for master's programmes as set by the Decree of the Flemish Community, based on the Framework of Qualifications for the European Higher Education Area (the Dublin Descriptors) and the European Qualification for Lifelong learning (EQF). The advanced scientific knowledge refers to the acquisition of specialised up-to-date knowledge and techniques, skills and attitudes required to integrate knowledge and apply it professionally. Special attention is given to analysing problems in developing countries and problem-solving under sub-optimal conditions. It is therefore imperative that in all course units attention is given, not only to the latest technological developments and equipment, but also to alternatives and design of low-tech solutions that encourage self-reliance in developing countries. UGent distinguishes itself as a socially committed and pluralistic university with a broad international perspective. The programme in Physical Land Resources fits perfectly with this profile.

The vision of education at the VUB is based on freedom of research and humanist values.

The panel observes a clear link between the programme-specific learning outcomes and the domain -specific learning outcomes, both concerning the level (master's) and orientation (academic). In the context of future improvements however, socio-economic aspects should be made more visible in the objectives.

According to the managers of the programme, the strong international focus of the ICP programme Physical Land Resources differentiates this programme from most other programmes dealing with similar topics. The panel agrees that the programme is unique, in the sense that it is the only programme of its kind in Flanders. A unique aspect of the programme is the in -depth approach of the geological component. The managers of the programme made a clear choice for a profile in which soil sciences play an important role. Some reference is made to the Tropical Natural Resources Management at KU Leuven and programmes in the Netherlands, the UK and Norway. But further benchmarking would be useful to improve the visibility of this profile.

The link with recent developments in an international perspective and with the demands of the professional field is appreciated by the panel. The panel is positive about the fact that the alumni and professionals were consulted in updating the learning outcomes. Alumni responded reasonably positively to questions related to the learning outcomes and reference is made to the professional (vocational) field in developing countries. The panel saw a systematic approach in adapting the formulations of the objectives in relation to the demands of the professional field.

Also, an extended survey has been carried out with the alumni. This also shows a clear system in testing whether the learning outcomes are adapted to the relevant demands. In addition, the numerous international contacts also serve as an implicit benchmark. The panel is of the opinion that, although the alumni have been consulted and their suggestions are taken seriously, the further benchmarking of the learning outcomes should be pursued.

In conclusion, the panel is positive about the clear choice of a profile in which soil sciences play an important role and about the clear link between the programme-specific learning outcomes and the domain

-specific learning outcomes. Further benchmarking would be useful to improve the visibility of this profile, and socio-economic aspects should be made more visible in the objectives. The link with recent developments in an international perspective and with the demands of the professional field is appreciated. The panel also saw a systematic approach in adapting the formulations of the objectives in relation to the demands of the professional field.

Generic quality standard 2 - Learning Process

The assessment panel evaluates the learning process for the Master of Science in Physical Land Resources as good

The panel is of the opinion that the learning process should enable the students to reach the objectives. The learning outcomes are well supported by the adequate teaching methods. A wide variety of teaching methods is used in the programme. All course units (except for "Internship" and "Master Dissertation") include lectures. Lecturing represents 27% of all teaching methods. The teachers are of the opinion that lectures are fundamental to providing students with the necessary basic knowledge. The number of teaching methods per course is 3 to 4. The following teaching methods are used in most of the course units: practical classes, PC-room classes and coached exercises. Independent work is used in 8 out of 32 course units. Field work and excursions are an important component of the programme. Teaching methods such as guided self-study, group work, demonstrations and microteaching are occasionally used. Concerning the learning materials, nearly all lecturers provide a syllabus or handbook and also provide their presentations electronically through the teaching platforms MINERVA (UGent) and POINTCARRÉ (VUB). The panel saw no problems with respect to the learning materials.

As well as the attractive variation in teaching methods and learning materials, the panel also saw an attractive, balanced and coherent programme in terms of content. The programme has a broad basis of introductory courses, supporting land resources engineering and soil science. The courses are strongly oriented towards the situation and problems in developing countries. The programme as a whole addresses all parties that are interested in soil and soil science for various reasons. The common core of the programme provides the basic knowledge that is fundamental to all parties concerned. The in-depth specialised knowledge provided in the Soil Science major is strongly oriented towards

agronomists and soil scientists, while geologists and civil engineers find the specialised training they need in the Land Resources Engineering major. There are nine compulsory courses offered in the first year, which form the common core of both main subjects. Lectures for these courses are all given at UGent, while all lectures for the second year courses of the Land Resources Engineering major are given at VUB.

The panel saw an interesting profile in which the courses of the Soil Science major provide the specialised knowledge and skills needed for all stakeholders who are concerned with the favourable use of land, and more particularly suitable spatial planning, and sustainable and optimised use and management of physical land resources. The courses of the Land Resources Engineering major are oriented towards the role of land and soil in geotechnics and in applied geology and geomorphology. The panel also observed that the overall contents progress from more general and guided subjects, towards more specialised topics and autonomous work.

The panel appreciates the fact that the courses have been related to the programme-specific learning outcomes and considers this programme as a good translation of the vision and the objectives. The rationale behind the two majors is justifiable and offers the students a curriculum with an interesting profile. Concerning the electives a problem with visibility arises: it would be helpful for students to provide them with a list of relevant existing courses to improve the visibility of possible electives. The panel recommends providing more options for the students, especially in the first year and the first semester of the second year. Also, a stronger emphasis on individual coaching is required, as the students progress in the learning path.

Also concerning the content of the programme, entrepreneurship and socio-economic courses should be considered. Students' should be made more aware of issues concerning entrepreneurship and should be made aware of the institutional context in the domain of physical land resources. The panel learned that socio-economic courses are present, but students ask for a higher degree of visibility and freedom of choice concerning these aspects. On the other hand, in the future the limited number of students should still impose a constraint on the amount of optional courses. Concerning the study-load and the way this is spread over the entire programme, the panel is generally satisfied. The Meteorology and Climatology courses need some adjustment, however.

The ICP Physical Land Resources relies on lecturers attached to different research departments of each faculty and university that is involved in the organisation of the programme. All lecturers are qualified and specialised in a relevant scientific discipline. The use of guest lectures also deserves the appreciation of the panel. The theoretical part of the courses is given by teaching staff and post -doctoral assistants (lectures, discussions). The practical exercises (laboratory and field work, computations, excursions) are given by the teaching staff and the assistant academic staff (including doctoral assistants). Other scientific staff are involved, because they can share their very specific expertise with the students. Administrative and technical staff are deployed for logistic support in laboratory exercises. The teaching qualities of the staff and the options for professionalisation, which are offered, satisfy the panel. The panel appreciates the formal approach in this context, in which participation in teacher training sessions is a formal criterion for decisions concerning appointments. Although teacher training is required and organised for new staff members, participation is not obligatory for the rest of the staff. The panel is of the opinion that teacher training should be required for tenured staff. Feedback about teaching and course quality arising from the evaluations is provided after each semester..

Taking into account that the student numbers are fairly small (on average 50 students over two years), which allows easy and direct contact with lecturers and other staff members, and thanks to the ICP financing by VLIR-UOS and the commitment of staff, paid from sources other than the university, reasonable and proper guidance of the students can be assured. There are enough staff in terms of both quantity and quality to train cohorts of 25 students: The number of teaching staff amounts to 20 for a total of 30 course units, excluding “Master Dissertation” and “Internship”. The panel considers the staff quantity as sufficient, but the limited technical staff should be a point of attention in the future.

The programme is open to students with a bachelor’s degree of minimum 3 years with good overall scores from a university or recognised equivalent. Applicants are expected to have basic science training in mathematics or statistics and chemistry or biochemistry, and an academic degree in a relevant discipline such as agriculture, biology, forestry, environment, land and water management, physical geography, geology or civil engineering. Relevant research or working experience of about 2 years is recommended, but not a prerequisite. Command of the English language is a very important criterion for admission. Applicants must be able to

prove their proficiency in English by providing a certificate. Candidates are first screened by the ICP Physical Land Resources coordinators at UGent (for the Soil Science major) and VUB (for the Land Resources Engineering major) to certify that the minimum requirements are met.

In the academic selection, the ranking is based upon the scoring of 5 criteria: academic performance, motivation, CV, recommendation letters and proof of reemployment. The criteria for academic performance include publications, awards, the reputation of the university where the student previously studied and the scoring system used by the university. The programme also strives for a well-balanced geographical distribution of the countries/continents and of gender. The majority of students are non-European and originate from Africa (65%) and Asia (30%). Central and South America are represented by 3% of the participants and 2% are European (mostly from Belgium). The intake is characterised by a high number of bachelor degrees (87%) and a lower number of master's (10%) and engineering degrees (3%). Nearly all students are of foreign nationality and most students have a VLIR-UOS grant. The VLIR-UOS grants are reserved for candidates from specific developing countries and 50% should originate from Sub-Saharan Africa.

Both the infrastructure of Ghent and the facilities of Brussels are considered as sufficient to support the students in achieving their objectives. The programme is organised on four campuses: at UGent (Campus De Sterre – Faculty of Sciences and Campus Coupure – Faculty of Bioscience Engineering) for all general and specific courses of the Soil Science major in the first year, for all elective courses of the Soil Science major in the second year and for all first-year general courses of the Land Resources Engineering major; at VUB (Campus Etterbeek – Faculty of Engineering) for one specific first-year course of the Land Resources Engineering major and for all second-year elective courses of the Land Resources Engineering major; and at ULB (ULB Campus de la Plaine – Faculty of Engineering) for one specific first-year course of the Land Resources Engineering major. All lecture rooms at all the involved campuses are provided with the necessary tools. At VUB however, the panel asks for vigilance about the capacity of the lecture rooms in relation to the number of students. All campuses have PC rooms which are used for exercises. At the Faculty of Bioscience Engineering (FBE – UGent), the lecture rooms are additionally equipped with digital tablets and at UGent and VUB, the possibility exists to record lectures or to organise tele-learning via videoconferencing. Also, specialised computer programmes have been developed for several

elective courses. As for library facilities at UGent, all research groups libraries at the FBE have been centralised in one faculty library. At the Faculty of Sciences (UGent) a faculty library is available and the research unit of Geology and Soil Science also has its specific library. At VUB there is one central library at Campus Etterbeek. Different specialised laboratories are available at all campuses, both at UGent and VUB. The panel is satisfied about these facilities.

The panel considers the organisation between the involved universities and faculties as a strong point. Also, the special guidance given to international students stands out as a good point. The students receive all detailed information that is relevant for the ICP Physical Land Resources upon their arrival, three weeks before the start of the summer school preceding the lectures. General practical information on UGent and the city of Ghent is given at the Welcome Days organised by UGent for international students. As for the students from the Land Resources Engineering major, the International Relations and Mobility Office (IRMO) at VUB organises an 'orientation day' at the beginning of the academic year. Since September 2012 a summer school organised by the Faculty of Bioscience Engineering, before the start of the academic year, has offered a range of introductory courses with the aim of levelling out the heterogeneous intake of students. The panel appreciates this initiative. In November, a guided visit to all the labs involved in the programme is organised, both at UGent and at VUB, for example offering the students a clear picture on possibilities for master's dissertation subjects.

At UGent and VUB, the guidance on learning paths is organised at faculty level. Before the start of the second master's year, all students have to compose their curriculum by making a selection from the optional courses list. This is done electronically by the students themselves, but with advice and assistance from both the PLR secretariat and the learning path counsellor of FBE. All curricula have to be approved by the learning path counsellor and by the course promoter of the respective faculties in consultation with the coordinators at UGent and VUB.

The panel is also positive about the guidance for the master's thesis. During the first semester, a guided visit to all the laboratories involved in the programme is organised for the first -year students. Following this tour, the students have to select a topic for the thesis project. The panel appreciates the fact that there is a wide range of thesis opportunities, including the possibility to choose a subject relevant for the home

countries, and the fact that the subjects are linked to the current research activities or to international projects in progress. By the end of May of the first year, the students have to contact a promoter of their choice. The panel is positive about the fact that students choose a subject and learn techniques that equip them for a job in their home country. In the second year, the full second semester is reserved for all the work related to the master's dissertation. Apart from regular meetings with the promoter(s), the students also receive support from assistants and technical staff. The students are guided in an adequate way, although some variation exists concerning the accessibility of the promoters.

The panel is of the opinion that all these aspects of the curriculum, the facilities and the staff come together in a coherent learning environment. Despite the extra difficulties of an interuniversity programme, all the pieces fit together adequately. Concerning the follow-up of the recommendations of the previous visitation panel, the panel is positive. Most recommendations have been adequately followed up; and those that are not, are countered with arguments that are justifiable in the present context.

In conclusion, the panel saw an interesting, balanced and attractive programme, both in content and in terms of teaching methods, supported by strong interuniversity collaboration, an internationally oriented staff and adequate material and guidance facilities. The programme has a strong international force that means that both teaching and research level closely reflect topical issues in the South. Internal quality assurance is characterised by a quality culture which means that there is great openness and careful thought is given to how the programme is run. Nevertheless, the panel sees scope for strengthening in that more focus could be given to entrepreneurship and socio-economic issues.

Generic quality standard 3 - Outcome Level Achieved

The assessment panel evaluates the outcome level achieved for the Master of Science in Physical Land Resources as satisfactory

Based on the UGent and VUB concepts on education, creative development of knowledge and autonomy, students are supposed to act as independent individuals. Therefore the programme opts for adequate supervision of the students and provides all the necessary means to assist them, but nevertheless the students themselves are responsible for their own

learning process and have to prove that they have achieved the necessary competences. Both universities (UGent and VUB) have an adequate examination and evaluation policy and an additional one for interuniversity cooperation. The programme management sees the examination policy as a method to evaluate the learning process and competences of the students, but at the same time the evaluation process should also be used in order to learn, to adjust and to improve the teaching and learning process where necessary. In this context the panel observed adequate attention to feedback. Feedback is given individually or to the whole group of students, during the learning process or after the evaluations. The panel appreciates the fact that feedback is considered as important to give the students the opportunity to adjust their study approach where necessary.

The panel is of the opinion that the programme enables the students to achieve the formulated learning outcomes, which is adequately operationalised in the assessment procedures. The broad range of assessment methods is clearly aligned to testing whether the learning outcomes are achieved. A combination of different evaluation methods is used. Permanent evaluations conducted throughout the semester are often used for exercises. The periodic first- and second-semester evaluations comprise the heaviest load of assessments. These evaluations can be oral or written, or a combination of both. Written exams count for 33%, reports for 21% and oral exams for 16%. Open book and oral examinations are particularly used for specialised courses. The use of peer evaluation and the presence of a course on presentations, are regarded as good initiatives. The lecturers of all compulsory courses have indicated which learning outcomes are targeted and/or evaluated by their course units. All lecturers explain and clarify the evaluation methods used during the lectures. of the assessment and confirm their satisfaction about the provision of information concerning the assessment. After each of the three examination periods, students can consult the lecturers to have a closer look at their exams. During this feedback, errors can be pointed out and study suggestions can be given by the lecturers. The lecturers autonomously decide upon the means of assessment to be used for the examinations they are responsible for. They determine whether the students have acquired the necessary knowledge, skills and insight. In addition, the Commission on Programmes annually approves the course specifications and verifies whether there is a good balance between the learning outcomes and the examination methods used. The panel is of the opinion that this results in an adequate validity and reliability of the examinations. Also, the Commission on Programmes (OC-PLR),

Examination Commission (EC-PLR) and Quality cell of Education at UGent and VUB guarantee the quality, validity and reliability of the assessment.

In addition to the clear communication about the assessment, the expectations are also clear to the students. Students are positive about the transparency. Also, an ombudsperson is accessible in order to solve problems and disagreements concerning the evaluation.

The ICP Physical Land Resources pays a lot of attention to the development of research skills, and therefore allocates an important part of the programme to the master's dissertation. Concerning the evaluation, a reading committee is set up for each of the master's dissertations at UGent. The members of the reading committee will also be members of the jury for the oral presentation and defence. The members of the reading committee make a report including a mark for each dissertation. The reports are drawn up using a fixed format to assess various aspects of the dissertation, and serve as a basis for the deliberations that follow the oral defence. The oral presentation is followed by questioning and discussion. The panel is positive about this evaluation procedure. Also, the students value the clear expectations related to this course. The preparation, guidance and evaluation procedures result in a high level of master's theses, which satisfies quality standards.

Over the last five academic years, most of the students (between 80% and 95%) obtained the degree in two academic years. The remaining part needed one more semester or one more year, often to finalise their master's dissertation. The panel considers this an adequate pass rate. The drop-out rate in the last five years varied from 5% to 23% (primarily students that were not or rarely participating in courses and/or taking exams). Although there is a downward trend in the drop-out rate, it should remain a point of attention.

Employability is assessed as adequate. The panel has no major concerns in this context. Most of the students have relevant professional experience before taking up their studies. In most cases VLIR scholars, who are linked to a university or a research institution, are re-employed by this university/ institution when they return to their home country in public service/ government or the agriculture/agro-industry sector. For several graduates, their studies here have been a stepping stone to PhD studies in Belgium or abroad. The great majority of alumni are employed in their country of origin and have indicated in the survey that they are very satisfied with

their current job. The majority also confirm that the level of their current position is in accordance with the level of their university education. In addition, most alumni state that their education has prepared them sufficiently for their current position. The panel would also like to support the suggested initiative of reinitiating the overhaul of courses in order to establish local or regional networks and to strengthen links with the University of Ghent.

Finally, the panel wants to express its appreciation of the very active alumni policy. This is clearly a very strong point of the programme. In the context of future improvement, the panel suggests improving communication with the alumni and using their remarks for new inputs for the programme and for the regional development of existing networks. For this, it is advisable to build on local centres of excellence, based on the UGent graduates.

In conclusion, the panel supports the vision and policy of the assessment and is of the opinion that the formulated learning outcomes are achieved. Also, the panel observed adequate attention to feedback and transparency, a broad range of assessment methods and adequate validity and reliability of the examinations. The thesis procedures result in a high level: the master's thesis satisfies international standards. The employability and pass rates are adequate, but the level of drop-outs should remain a point of attention. The active alumni policy is clearly a strong point of the programme, but their remarks could be used more for new inputs for the programme and for the regional development of the existing networks.

Final judgement of the assessment panel

Generic quality standard 1 – Targeted Outcome Level	G
Generic quality standard 2 – Learning Process	G
Generic quality standard 3 – Outcome Level Achieved	S

As Generic quality standard 1 is evaluated as good, Generic quality standard 2 is evaluated as good and Generic quality standard 3 is evaluated as satisfactory, the final judgement of the assessment panel about the Master of Science in Physical Land Resources is satisfactory, according to the decision rules.

The panel learned that after the assessment the program dealt with many of the recommendations e.g. extra benchmarking of the programme and the learning outcomes; larger rooms will be reserved at VUB…

Summary of the recommendations for further improvement of the study programme

Generic quality standard 1 – Targeted Outcome Level

- Make socio-economic aspects more visible in the objectives.
- Continue benchmarking to improve the visibility of the profile.

Generic quality standard 2 – Learning Process

- Provide the students with a list of relevant existing courses to improve the visibility of possible electives; allow more options for the students, especially in the first year and the first semester of the second year.
- Pay more attention to individual coaching, as the students progress in the learning path.
- Consider entrepreneurship and socio-economic courses in the content of the programme.
- Pay attention to the limited technical staff.
- Be vigilant about the capacity of the lecture rooms at the VUB in relation to the number of students.
- Pay more attention to explaining professional career opportunities, including business development.
- Reduce the variation concerning the accessibility of the promoters.
- Improve the proactivity of the programme committee; implement a quick evaluation system to keep the programme updated.

Generic quality standard 3 – Outcome Level Achieved

- Keep on monitoring the level of drop-outs.
- Improve the activities of the alumni and use their remarks for new inputs for the programme and for the regional development of the existing networks; build on local centres of excellence, based on the UGent graduates.

UNIVERSITEIT GENT
Master of Science in Aquaculture

SUMMARY
Master of Science in Aquaculture
Universiteit Gent

From 13 to 14 May 2014, the Master of Science in Aquaculture at UGent has been evaluated in the framework of an educational assessment by a peer review panel of independent experts. In this summary which describes a snapshot, the main findings of the panel are listed.

Profile of the programme

Aquaculture is a relatively young, diverse and dynamic industry, highly dependent on the knowledge input generated by various disciplines. The research and teaching at UGent started with a strong focus on larviculture of aquatic organisms both for European and (because of the historical and present research focus) tropical species, but has now taken on a much broader range, mainly through the foundation of the UGent R&D aquaculture consortium.

The activities of UGent laboratories involved in aquaculture research are brought together in the UGent Aquaculture R&D consortium (ARC), including 17 labs from 3 different faculties that are at least partly involved in aquaculture research. Since October 1991, ARC has been organising the English-language International Course Programme (ICP) Master of Science in Aquaculture within the Faculty of Bioscience Engineering. The

programme is oriented towards students from Southern and European countries.

Programme

The programme counts 120 ECTS and consists of two years: 75 credits from compulsory courses, 15 credits from optional courses and 30 credits from thesis work. In the first semester, general courses are programmed. In the second semester, more specific aquaculture courses are taught and students are exposed to aquaculture practices.

In the second year, the courses of the first semester are taken to greater depth and are combined with optional courses. A total of 15 ECTS needs to be chosen from a list of optional courses available at UGent. The second semester is focused on thesis work, allowing the students to integrate the acquired knowledge in personal research.

To stimulate guided self-study, students are given individual or group assignments. Practical exercises and guided theoretical exercises in small groups are also used. The students also visit aquaculture farms and research institutes in a one-week trip in Europe and during one-day excursions. Other teaching methods are classroom polling, microteaching and video conferencing. For the compulsory courses, classical classroom lecturing is the cornerstone of knowledge transfer, followed by guided self-study and practical exercises.

Evaluation and testing

Only 3 courses use one single evaluation tool. For all other courses, written exams are used to test the majority of learning outcomes, supplemented with one or more other assessment methods. Non-periodical assessment methods are also used: in 9 out of 17 compulsory courses a report or assignment is part of this non-periodical evaluation. The master's thesis has to be defended in public.

Services and student guidance

Administrative and other matters are taken up by the programme coordinators, who also thoroughly explain the programme, the laboratory and university facilities to new students. Also, all the relevant information is summarised in a 'Blue Book' provided to all newcomers. The Advisory Centre for Students offers information and guidance concerning the different aspects of their study career, before, during and after the

study period. Also, a study-counselling and career advice service is at the students' disposal. Students also can rely on the ARC secretarial staff for small and/or personal problems. The faculty's or university's ombudsperson can be called upon in the context of problems and conflicts concerning the assessment.

At the time of the site-visit the various teaching activities took place at scattered locations. Meanwhile the programme has moved to a new building.

Study success and professional opportunities

90% of all students finish the programme in two years and the drop-out rate is relatively low. About 75% graduate after 2 years; 15% after 3 years and 10 % are drop-outs (an average of 2 per intake cohort).

The impact of the programme on the career progression of alumni can be described as highly positive. About 65% of the alumni work in their home country and 13% go on to take a PhD.

ASSESSMENT REPORT
Master of Science in Aquaculture
Universiteit Gent

Preface

This report concerns the Master of Science in Aquaculture organised by Ghent University (UGent). The assessment panel (further referred to as the panel) visited the study programme during its visit to KU Leuven, from the 13th to the 15th of May 2014.

The panel assesses the study programme on the basis of the three generic quality standards (GQSs) of the VLUHR programme assessment framework. This framework is designed to fulfil the accreditation requirements set by the NVAO. For each generic quality standard, the panel gives a weighted and motivated judgement on a four -point scale: unsatisfactory, satisfactory, good or excellent. In the assessment of generic quality assurance, the concept of 'generic quality' indicates that the GQS is in place and that the programme – or a specific mode of the programme – meets the quality level that can reasonably be expected, from an international perspective, of a Master's programme in higher education. The score 'satisfactory' indicates that the programme meets the generic quality because it demonstrates an acceptable level for the particular GQS. If the study programme scores 'good', the programme systematically exceeds the generic quality for that standard. If the programme scores 'excellent', it achieves well above the generic quality for the particular GQS and serves as an (inter)national example. The score 'unsatisfactory' indicates that the programme does not attain the generic quality for that particular GQS.

The panel's opinions are supported by facts and analyses. The panel makes clear how it has reached its opinion. The panel also expresses a final opinion on the quality of the programme as a whole, also according to the same four-point scale. Judgements and recommendations relate to the programme with all subordinate modes or majors, unless stated differently.

The panel assesses the quality of the programme as it has been established at the time of the site visit. The panel has based its judgement on the self-evaluation report and the information that arose from the interviews with the programme management, lecturers, students, alumni and personnel responsible at programme level for internal quality assurance, internationalisation, study guidance and student tutoring. The panel has

also examined the course materials, Master's theses, test and evaluation assignments and standard answering formats, and numerous relevant reports available. For the student success rate, the panel has relied on the data provided by the programme management. The panel has also visited specific educational facilities such as classrooms, laboratories, experimental facilities and libraries during the site visit at the various universities.

In addition to its judgement, the panel also formulates recommendations with respect to quality improvement. In this manner, the panel wants to help improve the quality of the programme. The recommendations are included in the relevant sections of the respective generic quality standards. At the end of the report an overview is given of improvement suggestions.

Context of the study programme

The Master of Science in Aquaculture consists of 120 ECTS credits, spread over two years. The programme (all variants) has 39 students enrolled (2012–2013). The programme is organised within the Faculty of Bioscience Engineering (FBW) of UGent. The faculty is also responsible for numerous other master's programmes in the field of Bioscience and Bio-Engineering.

Aquaculture is a relatively young, diverse and dynamic industry, highly dependent on the knowledge input generated by various disciplines. Being of growing global importance, it is multi-faceted and this diversity is reflected in the background of the intake students. Since the 2006 assessment report, the activities of UGent laboratories involved in aquaculture research have been officially brought together in the UGent Aquaculture R&D consortium (ARC), including 17 labs from 3 different faculties that are at least partly involved in aquaculture research. Since October 1991, ARC has been organising the English-language International Course Programme (ICP) Master of Science in Aquaculture within the Faculty of Bioscience Engineering. The programme is oriented towards students from Southern and European countries and leads to the degree of Master of Science (MSc) in Aquaculture. It is supported by the Flemish Interuniversity Council – University Development Cooperation (VLIR-UOS). Since October 2007, IMAQUA has been a "Master after Bachelor" according to the Bologna agreement.

Each FBW programme is represented on one of the four Educational Committees, grouped per teaching language and/or profile. These

committees are responsible for the general management and organisation of the programme concerned. IMAQUA is represented on the OC-ABS, the Educational Committee of Applied Biological Sciences of the English-language master's programmes, meeting monthly in preparation for the monthly meetings of the Faculty Council. Several other FBW committees and groups are involved in education. The programme has a representative on the Curriculum Committee, responsible for assigning course exemptions, individual learning paths, etc. The final responsibility for the organisation of the education lies with the Faculty Council (FC), which, depending on the issue at stake, submits its decisions for approval to either the Board of Governors or the Executive Board. For educational issues the FC, chaired by the Dean, seeks advice from the Educational Committee concerned. The IMAQUA CG (Core Group) is responsible for the programme's daily management and educational, organisational and practical issues, addressing the topics of the OC-ABS at the programme level.

Generic quality standard 1 - Targeted Outcome Level

The assessment panel evaluates the targeted outcome level for the Master of Science in Aquaculture as satisfactory

The Master of Science in Aquaculture has a focus on the acquisition of existing scholarly knowledge and the competency to apply, integrate and expand it. The description of the programme-specific learning objectives is very much in line with the UGent competency model, the Dublin Descriptors and the Flemish Qualification Framework. The panel appreciates the fact that the necessary reflection takes place concerning the educational concepts of UGent ('dare to think' and creative knowledge development), and that the UGent competency model is incorporated in the objectives. The aim of the managers of the programme is to offer an industry-oriented approach to Aquaculture, with a profile that is more research-embedded than research-based. The panel approves of this balance and notes that the objectives are closely connected with the industry. Two learning objectives are exclusively industry-oriented.

The research and teaching at UGent started with a strong focus on larviculture of aquatic organisms both for European and (because of the historical and present research focus) tropical species, but has now taken on a much broader range, mainly through the foundation of the UGent R&D aquaculture consortium. The panel appreciates the strong orientation towards field applications and is of the opinion that the academic aspect is

not threatened by these choices. The panel is positive about the ambitions to implement a higher degree of specialisation. In this context however, it will be necessary to improve the aims concerning the academic component, to enable students to reach a higher degree of specialisation, starting from a stronger academic baseline. Also, it is advisable to communicate the objectives of each course and the contribution of each course to the programme -specific learning outcomes, to students at the start of each course.

For this particular master's programme, as the only master's programme in Aquaculture at a Flemish university, the programme-specific learning outcomes and discipline-specific learning outcomes are identical. The panel therefore finds that there is an adequate link between the domain-specific learning results and the programme-specific learning results, concerning both level (master) and orientation (academic).

The clear relation and strong link with the research institute/consortium ARC (Laboratory of Aquaculture & Artemia Reference Center) and the adequate international focus are considered as strong points. The aim of internationalisation is held at the highest possible level. Although only one programme is mentioned as a benchmark in the self-evaluation report, the teachers and managers of the programme are aware of the requirements of the international field and have a broad range of international contacts. There is a sufficient amount of contact between the research consortium and other relevant European institutes, but these should be better exploited to strengthen the position of the programme in the international context. There are also connections with European partner universities, but it is not clear whether comparisons were made to establish the relevance of the learning objectives.

Based on the self-evaluation report, the additional documentation and the discussions, the panel concludes that the programme has adequate international contacts. Most of them are rather informal contacts. The panel recommends to formalize them with the aim of the national and international benchmarking of the programme's learning outcomes. Such benchmarking offers programmes the potential to strengthen their profile on the basis of facts and figures. A full and thorough benchmarking exercise provides a lot of information for the further profiling and positioning of the programme both at home and abroad, and offers opportunities to communicate the profile of graduates in a clear manner to the employment market. This need for more attention to benchmarking

also includes greater involvement on the part of the alumni and students: the panel also observed a lack of formalised consultations with students and alumni. The panel is of the opinion that in this context opportunities are also being missed to strengthen the objectives and the programme.

In conclusion, the panel is positive about the link between the domain-specific learning results and the programme-specific learning results and about the strong orientation towards the field. The clear relation with the research institute/consortium ARC and the adequate international focus are considered strong points. However, there will be a need to improve the aims concerning the academic component, enabling students to reach a higher degree of specialisation, starting from a stronger academic baseline. Also, the present contacts between the research consortium and other relevant European institutes should be used more to strengthen the position of the programme, and further attention to (international) benchmarking, including more structured consultations of students and alumni, could result in more useful information for the development of the objectives and the programme.

Generic quality standard 2 - Learning Process

The assessment panel evaluates the learning process for the Master of Science in Aquaculture as satisfactory

The Master of Science in Aquaculture (IMAQUA) is a 2-year programme of 120 credits organised by ARC (Laboratory of Aquaculture & Artemia Reference Center): 75 credits from compulsory courses, 15 credits from optional courses and 30 credits from thesis work. In the first semester, general courses are programmed. In the second semester, more specific aquaculture courses are taught and students are exposed to aquaculture practices. In the second year, the courses of the first semester are taken to greater depth and are combined with optional courses. A total of 15 ECTS needs to be chosen from a list of optional courses available at UGent. The second semester is focused on thesis work, allowing the students to integrate the acquired knowledge in personal research.

In line with the remark the panel made concerning the objectives, in the implementation of the programme a higher degree of specialisation, starting from a clear academic core, should likewise be considered. The panel appreciates the fact that plans have already been made in this context, but recommends that they should be implemented as soon as possible. Specifically in the electives, a more in-depth approach to

aquaculture-related topics deserves further attention. The optional courses that are offered are too basic and too superficial, as they are mostly general courses from other faculties. The panel understands that the hesitations in this context are probably caused by the heterogeneous student population. However, it believes there are too few choices for electives. The panel also recommends the inclusion of specialisations such as fish diseases, larval culture and environmental impact/prevention in the reorganisation of optional courses. Also, ethical aspects should be more visible in the programme. Concerning the didactic approach and its relation to the objectives, the panel is satisfied. The panel appreciates the fact that, to stimulate guided self-study, students are given individual or group assignments. Practical exercises and guided theoretical exercises in small groups are also used. The students also visit aquaculture farms and research institutes in a one-week trip in Europe and during one-day excursions. The panel appreciates the introduction of new teaching methods, such as classroom polling, microteaching and video conferencing. For the compulsory courses, classical classroom lecturing is the cornerstone of knowledge transfer, followed by guided self-study and practical exercises. The panel appreciates the fact that two optional courses (Project and Internship) are being implemented to further emphasise the development of a wider range of competencies. The panel is of the opinion that the internship in particular should certainly be maintained in the future. Despite the above remarks, the alumni are content with the skills achievement.

Concerning the learning material in general, the panel sees no problems. Descriptive courses are mostly delivered using slideshows, of which printouts are distributed before teaching and made available via Minerva. In the range of teaching methods there is a sufficient amount of variety, although there is an emphasis on lectures. In the self-evaluation report it is mentioned that 'dare to think' and 'creativity' are important issues in the didactic policy of UGent, but it seems that in practice, at least for this programme, the emphasis is on knowledge acquisition. The students note that the interactive teaching methods which involve problem solving, such as discussions and group work, are the most helpful. However, relatively little time is spend on practical work. Another issue for improvement is the fact that, according to the students, some lecturers are not very interactive in their approach. Therefore, the panel recommends that more ways should be sought to improve the interactive aspect of the teaching activities. The panel heard from the students that they are very satisfied about the balance between theory and practice. The panel acknowledges

this, in relation to the profile of the programme and the formulated learning results. Also, the balance between compulsory courses and elective courses is good (apart from the earlier remark about the relevance and in-depth orientation of the electives), as well as the study load: the panel observed that the first semester is quite heavy, but doable.

Concerning the guidance given in the context of thesis work, the panel is positive in general, but the limited numbers of technical staff, as already mentioned, creates high pressure and a considerable work load. This leads to limitations in the support of thesis work, practicals and labs. The panel suggests that this problem should be addressed in the near future. The IMAQUA CG invites potential promoters to submit thesis subjects by the Easter holiday of the first year. Students are encouraged to take up subjects abroad, in which case a local promoter is assigned and practical arrangements are managed by the IMAQUA Core Group (CG) and the student him- or herself. The students select three subjects in order of decreasing priority. Final subject assignment is done according to this priority list and considerations of 'supply and demand'. In case of conflicting interests, the previous study score of the student is decisive. According to the students the topics of choice a higher degree of relevance for the home countries should be pursued. Students also say that there is too little choice in the range of topics and that there is too little time to finish the project. Therefore, the panel suggests starting the whole thesis process earlier in the programme. The lecturers sometimes advise their students to start earlier, but the panel is of the opinion that in the future this should be formalised in the timing of the procedures. After the definitive assignment (second semester of the first year), students are invited to contact their promoter for practical information. Practical work generally starts between the finalisation of the first year and the completion of the second year's first examination session. Before the actual work starts, the student can study the literature and receive methodological training. The second year's second semester is entirely dedicated to thesis work. The promoter and the tutor interact to provide guidance to the students. The tutor instructs the students about the research facilities and provides the materials. As thesis work often fits within ongoing research, frequent meetings with the promoter/tutor take place, requiring an active contribution from the students. The promoter/tutor also coaches the student in the writing process. In the opinion of the panel, the students should be able to submit a detailed and funded plan before the end of the first semester of the second year. Also, the deadlines should be monitored more closely. Because practical work generally starts

in the last semester, the students submit their thesis at the end of August. The panel observed that this has become a kind of standard, which is not appropriate. The Panel recommends to work towards a structural solution for the time invested in the master thesis. It is necessary that student are capable of finishing there thesis within the anticipated study time. The panel considers it necessary to pay more attention to project management in the programme and the master's thesis in particular.

The quality of the staff is appreciated. The panel observed an adequate team with solid international expertise. There is extensive international exposure through projects and programmes with countries in the South. Also, a joint master's programme is being constructed with Can Tho in Vietnam and Stellenbosch in South Africa. In the self-evaluation report, it is explained that all teaching and support staff are currently active in scientific aquaculture research, and that courses are taught by specialists in the field, thus guaranteeing state-of-the-art content of courses and the transfer of relevant knowledge. The panel agrees with these statements: the programme is clearly taught by leading scientists, with top positions at the international level. The amount and quality of their publications underline this observation. Also, the initiative of developing a tripartite programme with the South, and the efforts to attract more lecturers from the Consortium to work with ARC, are appreciated by the panel. Some members of staff are formally exposed to the private sector or industry and have strong ties with the professional field, more specific EATIP (European Aquaculture Technology and Innovation Platform) and EAS (European Aquaculture Society). The panel observes an adequate amount of attention to didactic qualities and a sufficient number of available courses in the context of didactic professionalisation. Newly appointed lecturers are obliged to follow didactic training sessions. Other lecturers have free access to all courses and information sessions, but participation in these professional development activities can be more intense. The educational training of the teaching staff needs to be addressed, in light of students' remarks about the lack of interactivity of some lecturers. Also, given the diversity of students, it is necessary to implement a higher degree of variation in the teaching methods. The panel therefore considers it necessary to adopt a proactive approach to detect professional development need. It therefore recommends that the programme should develop a team-oriented professional development policy. Concerning the quantity of the staff, the panel sees no acute problems, although the high pressure on the technical staff should be addressed. The amount of teaching staff members (AAP and ZAP) is sufficient, but in line with the

plans and the need for implementation of a higher degree of specialisation, more partners should be invited to participate in the programme. The students also confirmed that the teaching staff are available to answer questions.

The programme mainly attracts students from Southern countries, and a smaller number from Europe including Belgium. The programme is open to holders of a Bachelor's degree in exact or applied sciences, equivalent to at least 3 years of university studies or a degree in Veterinary Medicine, Civil Engineering or Agricultural Engineering or any related area. Holders of other degrees need to follow extra courses. Some background in aquaculture is recommended. There are two types of intake students: those applying for a VLIR scholarship are actively selected by the IMAQUA CG in agreement with VLIR, while non-scholarship holders can freely enrol if they meet the admission requirements and can provide a guarantee of financial proficiency. Another requirement is proficiency in English. The required score on the admission test for English has been raised by the faculty from 6 to 6.5. The majority of the students originate from Southern countries and hold a VLIR-UOS scholarship (the latter averages around 13 per year). The number of applications has stabilised at around 120 per year. There are 5–8 non-VLIR students every year. Over the last 5 years the majority of starters have come from Asia (44–65%), followed by Africa (20–44%) and Europe (0–22%). Occasionally, SouthAmerican students participate in the programme. The bachelor's degrees of intake students are mostly in related sciences, such as aquaculture and fisheries. The panel notes that the summer school is a good way to try to align the level of incoming students. It is of the opinion that this popular initiative provides a good and broad introduction to new students. On the other hand, the panel strongly advises vigilance with regard to the variation in the level of incoming students. Despite the good initiative of offering a summer school, a stricter admissions policy is unavoidable to guarantee the initial level of the students.

The panel commends the good guidance given to the students, including ICP students. The alumni were very positive about the guidance they received during their trajectory. The students have also expressed their satisfaction. Since 2010, all UGent VLIR-UOS grantees have been welcomed at Brussels airport by designated second-year students. The latter guide the newcomers during the first few days. The panel considers this a valuable approach. Administrative and other matters are taken up by the programme coordinators, who also thoroughly explain the programme, the

laboratory and university facilities to new students. Also, all the relevant information is summarised in a 'Blue Book', provided to all newcomers. The Advisory Centre for Students offers information and guidance concerning the different aspects of their study career, before, during and after the study period. Also, a study-counselling and career advice service is at the students' disposal. However, in general, problems are reported to and solved by the programme coordinators, given their close contact with the students. Students also can rely on the ARC secretarial staff for small and/or personal problems. The faculty's or university's ombudsperson can be called upon in the context of problems and conflicts concerning the assessment. The students explained that, for purely academic issues, they can contact the teaching staff at any time. Concerning study progress, guidance and ombudsperson services, the panel is positive. The positive words of the students and alumni underline this finding.

The panel observed some problems in the context of the material facilities: the various teaching activities take place at scattered locations, some of them are not well equipped for the number of students. At present, at Rozier 44, the following facilities exist: lecture rooms (1 lecture room for 40 students and one meeting room that is occasionally used for lectures for up to 25 students; for larger groups other lecture rooms are available in the same building or at FBW; if lectures take place at one of the other universities, the students travel in a group by train); practical rooms and laboratories (6 wetlabs, 3 microbiology rooms, a microscopy room, a chemical lab and a nutrition room; the laboratories are equipped to enable the students to do their research, with all required analytical instruments and experimental set ups); computer facilities (students have access to all computer rooms of all university buildings in town); and the library (with a complete collection relevant to aquaculture in Belgium). The venues of lectures are clearly stated in the lecture schedule. The facilities, however, are not equipped for an average number of 50 students. This makes it necessary to divide the students into groups, which causes unwelcome obstacles to the students' learning process, and especially organisational difficulties for the staff. For the teaching staff it appeared to be very stressful to organise the teaching activities in these scattered locations. Also, communication with international students is difficult in this context.

However, the programme will move to a new building in 2014. ARC will be housed in a completely new building on the campus of the Faculty of Bioscience Engineering (Coupure Links), containing 8 wet labs, 1 landscape

office, 4 offices, a chemistry lab, a molecular & biological lab, a quality control lab, a challenge room, a washing room, and a refectory for staff and PhD students. The panel is positive about this plan, and is certain that this will solve the precarious housing problem and the inconveniences of the scattered locations.

Also the students express their satisfaction. Since 2010, all UGent VLIR-UOS grantees are welcomed at Brussels airport by appointed second-year students. The latter chaperone the newcomers during the first days. The panel finds this an interesting approach. Administrative and other matters are taken up by the programme coordinators who also thoroughly explain the programme, the laboratory and university facilities at the start of the study of new students. Also, all the relevant information is summarized in a "Blue Book", provided to all newcomers.

Finally, the panel wants to address the approach concerning internal quality assurance. The panel is of the opinion that the system of internal quality assurance is adequate, both in the context of identifying aspects to work on and in the context of choosing the right follow-up procedures. Most recommendations of the 2006 visit have been carried out, or at least discussed. Some remarks, however, stand out as having received inadequate follow-up. An example is the already mentioned need for specialisation and the effects of this need on the programme. Also, the need (addressed by the previous assessment panel) to involve stakeholders (alumni, students and the professional field) to a larger extent, seems to elicit a quite defensive reaction: the panel observed some resistance to surveying stakeholders about the level of the programme. The panel stresses the need to conduct regular surveys to obtain feedback from stakeholders (students, alumni, lecturers, industry and collaborating EU and Southern academic institutions).

In conclusion, the panel observes adequate coherence in the learning environment, in the relations between students, support staff, teaching staff and the programme. The programme, however, is now entering a stage in which further attention to coherence will be necessary. The new infrastructure and the plans to implement a higher degree of specialisation are necessary initiatives to overcome the potential future reduction of the level of the programme. The development of a proactive policy in short term is therefore necessary. Also, more coordination between the lecturers and an improvement in teaching and evaluation methods is advised for the further optimisation of coherence.

Generic quality standard 3 - Outcome Level Achieved

The assessment panel evaluates the outcome level achieved for the Master of Science in Aquaculture as good

The panel is of the opinion that the students achieve the formulated learning outcomes. Concerning the vision and policy on testing and examinations, the panel is satisfied. IMAQUA supports the vision and policy on evaluation of the FBW, which is used as an overall framework for evaluation. Also, the set of teaching and evaluation rules used at university and faculty level is clear for the staff and the students. For 'validity' and 'reliability' the main responsibility relies with the individual lecturers. The examiner should ensure that questions match the learning objectives and originate from different parts of the course, and that the set of questions is unbiasedly representative of the entire course. When different lecturers are involved in a course, the course holder collects the questions and agrees with the co-lecturers on the relative score assigned to each question. After individual correction by the co-lecturers, the course coordinator collects the scores, calculates the totals and uploads them on-line. The managers of the programme state that there is close overall interaction among IMAQUA lecturers and between lecturers and the programme organisers (through the Core Group and informal contacts). Moreover, the programme is thoroughly embedded in daily ARC activities, with several people of different levels being part of the core group as well. The panel is of the opinion that this results in sufficient validity and reliability of testing. The managers of the programme state that IMAQUA aims at a congruent evaluation concept using tools adapted to the targeted learning outcomes. The lecturer is responsible for choosing the optimal evaluation tools in the framework of UGent's general teaching and examination regulations and the characteristics of the course.

In general, the students appreciate the system as being fair and adequate. The panel appreciates the fact that in almost all courses various evaluation methods are used and the fact that the link between the assessment methods and the learning objectives is monitored closely. Only 3 courses use one single evaluation tool. For all other courses, written exams are used to test the majority of learning outcomes, supplemented with one or more other assessment methods. Non-periodical assessment methods are also used: in 9 out of 17 compulsory courses a report or assignment is part of this non-periodical evaluation. The panel finds the balance between formative and summative evaluation to be correct, but is of the opinion

that written examinations are still overemphasised. Although there is a clear presence of intermediate assignments and an adequate diversity of assessment methods, the number of oral presentations needs to be optimised. Students are required to complete a high number of written assignments, but the oral aspect remains limited. Only for 3 compulsory courses are oral exams used. The number of presentations by students about their research could be increased in particular.

The programme should put more effort into developing a well communicated, feedback-oriented assessment and examination system. The panel regrets the fact that feedback is lacking in a number of cases. The students also ask for more intermediate feedback, as the only feedback they receive is the examination grades and reports provided after the examinations. As this feedback is almost always provided afterwards and merely in the form of scores, the students miss the opportunity to learn from their mistakes. On the other hand, the lecturers are available for feedback as soon as the results are visible for the students (after their announcement) and students and lecturers are invited to the announcement of grades, where feedback may be given too. In the students' evaluation of the lecturers, the majority of students described the lecturers as 'approachable' and the feedback they received on evaluations was sufficiently 'useful and relevant'. Even so, the panel is of the opinion that more frequent and more detailed feedback should be internalised 'during' the learning process.

As IMAQUA students come from diverse teaching backgrounds and disciplines, many of them are unfamiliar with the Belgian evaluation system. This means that transparency is essential in this programme. The panel is satisfied in this context. During each course, students are informed about the evaluation process (also available through the clear and adequate ECTS files). Lecturers may elaborate on previous examinations and on how questions are formulated. Also, the communication about the assessment is transparent. The examination schedule is announced according to faculty procedures and the Education and Examination Code (OER) regulations, through Minerva.

The quality of the master's thesis is of international level, and this high level frequently leads to publications in scientific journals. In line with the high level of the thesis, the scores are also generally high. Concerning the assessment of the thesis, the panel is satisfied. The requirements are reflected in the various evaluation criteria. The thesis work is evaluated based on the written manuscript and a public defence, according to FBW-

rules. The oral defence is organised according to the FBW rules. Students are requested to give a rehearsal presentation about 1 week before the actual defence, in front of an audience of ARC scientific staff. In the period between the rehearsal and the actual defence, the students implement their remarks, suggestions and recommendations. After the actual defence – during the deliberation – the tutor provides information on student performance throughout the thesis work (laboratory work, data analysis, writing, general autonomy and maturity, scientific rigour). As already stated, this assessment procedure results in adequate scoring, which is representative of the resulting level of end products. A template score sheet is available for the thesis, linking scores to the required learning outcomes.

Concerning the pass rates and study progression, the panel is positive. 90% of all students finish the programme in two years and the drop-out rate is relatively low. About 75% graduate after 2 years; 15% after 3 years and 10 % are drop-outs (an average of 2 per intake cohort). More elaborate analyses and explanations concerning the pass and drop-out rates, and further minimisation of the drop-out rate should be pursued, however.

To check employability, an online survey was sent to all 112 alumni who have graduated since the 2006 assessment report. 58 alumni responded. 51 respondents are presently employed in aquaculture, with only 2 respondents being unemployed. This convinces the panel of the high value of the diploma in the job market. The impact of the programme on the career progression of alumni is described as highly positive. For example, the majority of respondents (80–90%) recognise that they frequently use the acquired knowledge and skills in their present job and that the programme has prepared them sufficiently for their current job. Also, 65% of the alumni work in the home country and 13% go on to take a PhD. At least 49 A1 publications have been produced.

The panel is satisfied about employability and the focus on industry, but would like to recommend improving the network of alumni and using this extended network to a higher degree. The alumni are positive about the achieved level, but in the context of further improvement, the sharing of experiences with and between alumni would provide more benefits. The panel is of the opinion that a more involved and closely related network of alumni, with more initiatives concerning a website and mailings, could be useful for the programme and its results.

In conclusion, the panel appreciates the validity and reliability of the assessment, the variation of evaluation methods and the close attention to the link between the assessment methods and the learning objectives. However, written examinations are overemphasised, the number of oral presentations should be optimised and in the context of feedback more initiatives are necessary. The transparency of the assessment is adequate and the quality of the master's thesis is of international level. Concerning the pass rates, study progression and employability, the panel is positive, but the extended network of alumni should be utilised to a higher degree.

Final judgement of the assessment panel

Generic quality standard 1 – Targeted Outcome Level	S
Generic quality standard 2 – Learning Process	S
Generic quality standard 3 – Outcome Level Achieved	G

As Generic quality standard 1 is evaluated as satisfactory, Generic quality standard 2 is evaluated as satisfactory and Generic quality standard 3 is evaluated as good, the final judgement of the assessment panel about the Master of Science in Aquaculture is satisfactory, according to the decision rules.

The panel learned that after the assessment the programme dealt with many of its recommendations e.g. incorporating the course and programme specific learning outcomes in the university study guide; strengthen the international position of the programme; installing two majors...

Summary of the recommendations for further improvement of the study programme

Generic quality standard 1 – Targeted Outcome Level

- Improve the objectives concerning the academic component to enable students to reach a higher degree of specialisation, starting from a stronger academic baseline.
- Communicate the objectives of each course and the contribution of each course to the programme -specific learning outcomes, to students at the start of each course.
- Formalize the attention to international benchmarking to strengthen the position of the programme in the international context, including more formalised consultation of the alumni and students.

Generic quality standard 2 – Learning Process

- Look for more ways to improve the interactive aspect in the teaching activities.
- Implement a higher degree of specialisation, starting from a clear academic core; strive for a more in -depth approach to aquaculture -related topics, especially in the electives; include specialisations such as fish diseases, larval culture and environmental impact/prevention in the reorganisation of optional courses.
- Make ethical aspects more visible in the programme.
- Take more initiatives to strengthen the basic knowledge of incoming students.
- Address the didactic training of the teaching staff in the context of the students' remarks about the lack of interactivity and the implementation of a higher degree of variation in the teaching methods.
- Reduce the pressure on the technical staff, in line with the plans and the need for implementation of a higher degree of specialisation.
- Solve the precarious housing problem as soon as possible.
- Start the whole thesis process earlier in the programme.
- Optimise the coherence of the programme in line with the new infrastructure and the plans to implement a higher degree of specialisation; pay more attention to coordination between the lecturers and to improving teaching and evaluation methods.
- Conduct regular surveys to obtain feedback from stakeholders.

Generic quality standard 3 – Outcome Level Achieved

- Reduce the number of written examinations and optimise the number of oral presentations.

- Give more frequent and more detailed feedback during the learning process.
- Communicate the final score of the master's thesis in a fully transparent manner.
- Pay more attention to analyses and explanations concerning the pass and drop-out rates, and reduce the drop-out rate.
- Initiate a more involved and closely related network of alumni.

UNIVERSITEIT GENT
International Master of Science in Rural Development

SUMMARY
International Master of Science in Rural Development
Universiteit Gent

From 20 to 23 May 2014, the International Master of Science in Rural Development at UGent has been evaluated in the framework of an educational assessment by a peer review panel of independent experts. In this summary which describes a snapshot, the main findings of the panel are listed.

Profile of the programme

The International Master of Science in Rural Development (IMRD-ATLANTIS) aims to train specialists in integrated rural development, resource governance and international policies, for effective worldwide action.

The programme aims to offer a variety of insights, frameworks, methods and practices for interdisciplinary intervention in rural economies and rural development; international mobility and direct experiences in different international contexts; multicultural exchanges and training in skills; and capacities to exchange, integrate and use scientific and other knowledge that leads to positive action.

IMRD-ATLANTIS is different from most master's programmes in this domain, because it brings together European and non-EU universities into

one consortium and because it attracts a diverse international student group.

Programme

The content of the programme consists of one basic and two specialised training modules, the case study of one month, and an individual master's dissertation research project. The main modules are organised over four study periods (covering two academic years) during which students must acquire a minimum total of 120 ECTS credits.

The programme involves a high degree of student and scholar mobility. Students need to comply with the mobility requirements in order to obtain the IMRD joint degree diploma, e.g. by studying at a minimum of two EU universities. Students can obtain the IMRD degree through the Erasmus Mundus track or the ATLANTIS track.

All students start with the general entrance module at UGent, ensuring an equal baseline knowledge level for all students. ATLANTIS-track students may also start their studies in the US. UGent serves as coordinating university.

The students start with principal courses and go on to more applied and specialised courses leading to group work in the case study, and to independent work in an internship and the master's thesis. The students can choose their own path by selecting two specialised modules and by selecting the countries they want to become acquainted with. Within certain (practical) constraints, the students are granted the freedom to adjust the programme to their needs and interests.

The added value of the international mobility scheme is the combination of courses and host locations, each with their specific teaching methods and specialisation opportunities. The mobility scheme allows students to experience different paradigms and realities of rural development and contributes to the comparative study of EU and non-EU settings.

Evaluation and testing

Students are confronted with different assessment systems (classic exams, assessments of individual and group assignments, presentations, group work, etc.). Written exams are the most commonly used evaluation method, yet students are also evaluated on the basis of assignments and

oral exams. Reports, skills tests, participation and presentations are only used in a minority of the courses. For most courses, examples of exam papers or assignment papers are made available.

Services and student guidance

At least one month before their arrival in Ghent, students receive a welcome pack, with all practical information on how to prepare for their journey to Europe. Once enrolled, the central secretariat informs students about timely registration at other universities, sends letters of support for visa applications, scholarship applications and assists with preparation for travel and enrolment.

Study success and professional opportunities

Most students graduate within the foreseen 2-year timeframe. Some students participating in the ATLANTIS programme take longer to graduate. A minority of the students takes three years to graduate.

The majority of graduates have the possibility to return to their previous employment (in particular the students who were employed as assistant professors or researchers at universities). Alumni from the US and European students appear to have more difficulties in finding a job than students coming from developing countries, but in general graduates seem to be able to find good job opportunities.

ASSESSMENT REPORT
International Master of Science in Rural Development
Universiteit Gent

Preface

This report concerns the international Master of Science in Rural Development organised by the Faculty of Bioscience engineering of Ghent University (UGent). The assessment panel (further referred to as the panel) visited the study programme during its visit to KU Leuven, from the 20th to the 23rd of May 2014.

The panel assesses the study programme on the basis of the three generic quality standards (GQSs) of the VLUHR programme assessment framework. This framework is designed to fulfil the accreditation requirements set by the NVAO. For each generic quality standard, the panel gives a weighted and motivated judgement on a four -point scale: unsatisfactory, satisfactory, good or excellent. In the assessment of generic quality assurance, the concept of 'generic quality' indicates that the GQS is in place and that the programme – or a specific mode of the programme – meets the quality level that can reasonably be expected, from an international perspective, of a Master's programme in higher education. The score 'satisfactory' indicates that the programme meets the generic quality because it demonstrates an acceptable level for the particular GQS. If the study programme scores 'good', the programme systematically exceeds the generic quality for that standard. If the programme scores 'excellent', it achieves well above the generic quality for the particular GQS and serves as an (inter)national example. The score 'unsatisfactory' indicates that the programme does not attain the generic quality for that particular GQS.

The panel's opinions are supported by facts and analyses. The panel makes clear how it has reached its opinion. The panel also expresses a final opinion on the quality of the programme as a whole, also according to the same four-point scale. Judgements and recommendations relate to the programme with all subordinate modes or majors, unless stated differently.

The panel assesses the quality of the programme as it has been established at the time of the site visit. The panel has based its judgement on the self-evaluation report and the information that arose from the interviews with the programme management, lecturers, students, alumni and personnel responsible at programme level for internal quality assurance,

internationalisation, study guidance and student tutoring. The panel has also examined the course materials, Master's theses, test and evaluation assignments and standard answering formats, and numerous relevant reports available. For the student success rate, the panel has relied on the data provided by the programme management. The panel has also visited specific educational facilities such as classrooms, laboratories, experimental facilities and libraries during the site visit at the various universities.

In addition to its judgement, the panel also formulates recommendations with respect to quality improvement. In this manner, the panel wants to help improve the quality of the programme. The recommendations are included in the relevant sections of the respective generic quality standards. At the end of the report an overview is given of improvement suggestions.

Context of the study programme

The international Master of Science in Rural Development (IMRD-ATLANTIS) consists of 120 ECTS credits, spread over two years. The programme (all variants) has 52 students enrolled (2012–2013). The programme started in 2004 as an Erasmus Mundus course funded by the EU. The International Master of Science in Rural Development is jointly organised by a consortium of leading universities in Agricultural Economics and Rural Development from all continents. The programme is supported by the Erasmus Mundus (EM) programme of the European Union.

The programme and consortium is governed by a structure consisting of a Management Board (MB), a Course Coordinator, a Central Coordination Secretariat led by a Technical Coordinator, and 6 Local Secretariats. The Management Board is composed of the Course Coordinator, one representative ZAP member per partner, a Technical Coordinator of the coordination secretariat and a student representative. The Management Board (MB) meets at least twice a year and is responsible for the content and structure of the programme, all academic decisions concerning evaluation, academic admission of students and scholarship applicants, granting of scholarships, controlling the financial health of the consortium, and advising and deciding on any other academic or organisational issues. The Course Coordinator is in charge of the day-to-day management and implementation. He leads the Central Coordination Secretariat, located at UGent. The partner universities each have a Local Secretariat headed by a

Local Coordinator who is responsible for ensuring local qualitative design and development and for the delivery of specific modules. Academic decisions are to be approved by the Education Committee – Applied Biological Sciences (OC-ABS).

Generic quality standard 1 - Targeted Outcome Level

The assessment panel evaluates the targeted outcome level for the International Master of Science in Rural Development as excellent

According to the self-evaluation report, IMRD-ATLANTIS is different from most master's programmes in this domain, because it brings together European and non-EU universities and research institutes into one consortium and because it attracts a diverse international student group. A high level of mobility allows for comparative learning about rural development, agricultural economics, policy models, and the use of different approaches. Sustainable development is a core challenge in both developed and developing countries. The Objectives of sustainable rural development are to raise economic performance levels in all rural economic sectors, to shape viable rural communities, to maintain indigenous culture, to protect the environment and to conserve natural resources and features.

The panel appreciates the vision of the programme and the broad and ambitious learning outcomes for Rural Development. IMRD-Atlantis is an international programme that aims to train specialists in integrated rural development, resource governance and international policies, for effective worldwide action. The programme aims to offer a variety of insights, frameworks, methods and practices for interdisciplinary intervention in rural economies and rural development; international mobility and direct experiences in different international contexts; multicultural exchanges and training in skills; and capacities to exchange, integrate and use scientific and other knowledge that leads to positive action.

The programme -specific learning outcomes fit within the domain -specific learning outcomes on Rural Development and Nutrition, which apply to both IMRD-Atlantis and the International Master in Nutrition and Rural Development at the FBW. The panel appreciates the clear link between the programme-specific learning outcomes and the domain -specific learning outcomes, both concerning level (master) and orientation (academic). In fact, the domain -specific learning outcomes are identical with the

programme-specific learning outcomes. The programme-specific learning outcomes are formulated according to the UGent competency model, which takes into account the Framework of Qualifications for the European Higher Education Area and the European Qualification Framework for Lifelong Learning (EQF). They comply with the competencies for academic master's programmes that have been set by decree of the Flemish Community. The panel also appreciates the fact that learning objectives are developed at programme, module and courselevel and the fact that the target is clearly the international, multifunctional and multidisciplinary development of the students.

The learning objectives are of a high international standard and reflect the cooperation of highly qualified universities. The panel saw a unique ambition for a common vision, developed by international universities. The link between the actual international demands of the professional field and the learning objectives of the programme, pleases the panel. It is clear that the opinions of professionals are taken into account. Concerning comparisons with other relevant programmes in the international field, the managers of the programme did their homework very well. The panel also appreciates the ambitions to integrate the different profiles of a high number of highly qualified universities into one strong Erasmus Mundus programme.

Also, the use of information from surveys of alumni and relevant professional organisations is considered as a strong point. A lot of work has been done on a systematic approach to gathering feedback about the objectives, both from the alumni and from the employers.

In conclusion, the panel saw a unique ambition for a common vision, developed by international universities, and the broad and ambitious learning outcomes are appreciated. Also, the clear link between the programme-specific learning outcomes and the domain -specific learning outcomes, the fact that learning objectives are developed at programme, module and course level, the fact that the target is clearly the international, multifunctional and multidisciplinary development of the students, and the link between the actual international demands from the professional field and the learning objectives, please the panel. Finally, the use of information from surveys of alumni and relevant professional organisations is considered as a strong point.

Generic quality standard 2 - Learning Process

The assessment panel evaluates the learning process for the International Master of Science in Rural Development as excellent

The content of the master's programme consists of one basic and two specialised training modules, the case study of one month, and an individual master's dissertation research project. The main modules are organised over four study periods (covering two academic years) during which students must acquire a minimum total of 120 ECTS credits. The programme involves a high degree of student and scholar mobility. Students need to comply with the mobility requirements in order to obtain the IMRD joint degree diploma, e.g. by studying at a minimum of two EU universities. Students can obtain the IMRD degree through different tracks:

The Erasmus Mundus track, which is part of the EU EM scholarship programme. This track involves spending time at a non-EU partner university and aims to give students a better understanding of rural development in transition countries (India, South Africa, Ecuador and China).

The ATLANTIS track, which allows comparative analysis of EU and US rural development and agricultural economic problems and policies. This track involves mobility between EU and US.

The panel is of the opinion that the learning process is adequately linked with the programme-specific learning outcomes and that the programme enables the students to reach the objectives. The panel saw a unique structure of highly qualified universities, covering all relevant socio-economic subdisciplines. An important challenge for IMRD is the wide international intake of students with different backgrounds, skills, knowledge and educational teaching methods and realities. The challenge lies in the adjustment of the teaching to the background and international composition of the student group. The panel observed that the didactic approach meets this challenge. The panel especially commends the good practices demonstrated in both the case studies and the internships, which are both highly appreciated by students. In the context of the case study, students are brought together for one month in an unfamiliar situation, learn how to evaluate this situation and perform a group assessment. Also, the other teaching methods are supportive of the learning objectives, as became clear from the tables of teaching methods added to the self-

evaluation report, from self-evaluation report and from the interviews. The students are satisfied in this context. The balance between purely theoretical education, practical assignments, seminars (with guest lecturers) and other forms of training is correct. Lectures and tutorials are used as major instruments to build knowledge and insights, and are combined with practical exercises, group assignments and independent work assignments. Group work, coached exercises and excursions complement the lectures and seminars. The panel also appreciates the amount of team work and presentations which are incorporated in the programme, and sees a clear variety in teaching methods. Only in the first semester of the first year, is there an emphasis on lectures.

All students start with the general entrance module at UGent, ensuring an equal baseline knowledge level for all students. ATLANTIS-track students may also start their studies in the US. UGent serves as coordinating university, responsible for the overall management, for monitoring student records and for issuing diplomas.

The panel observed a rigorous and convincing system to check the link between the programme, the individual courses and the formulated objectives. The students start with principal courses and go on to more applied and specialised courses leading to independent work in the case study, an internship and the master's thesis. the students can choose their own path by selecting two specialised modules and by selecting the countries they want to become acquainted with. Within certain (practical) constraints, the students are granted the freedom to adjust the programme to their needs and interests. In order to ensure that the learning outcomes are delivered to all students, a number of safeguards are built into the programme: the entrance module, the case study and of course the master's thesis, are obligatory. In -depth insights can be acquired during specialised modules. The panel is satisfied about the content and structure of this programme and appreciates the fact that the curriculum encompasses all relevant socio-economic subdisciplines. However, the large amount of freedom given to students in constructing their own programme, should be monitored more closely *(see below)*.

According to the self-evaluation report, the added value of the international mobility scheme is the combination of courses and host locations, each with their specific teaching methods and specialisation opportunities. The mobility scheme allows students to experience different paradigms and realities of rural development and contributes to the comparative

study of EU and non-EU settings. Further, offering modules in the research specialities of each partner creates genuine added value. The panel encourages the exchange of good practices in teaching methods and course design between staff of the cooperating universities.

Both the master's dissertation and the case study are considered to be key components in the IMRD Atlantis programme. A recent addition is the internship. The panel wishes to complement the managers of the programme for their achievements in this context. According to the panel, the thesis instructions and procedures are clear and adequate. During the first semester, students are guided to develop a mobility track responding to their research interests. The master's dissertation is written on a topic related to rural development or rural economies. At the start of each academic year, the different partner institutes provide an overview of different thesis topics/themes. In some cases, these topics are part of a broader research programme, giving the students the opportunity to become part of a research team. Students are also encouraged to come up with their own thesis subject, preferably one relevant to their home country, but they can also work on a topic presented to them by their promoters. The mobility in the fourth semester is based on the specialisation path followed by the students. The students spend this study period at one of the locations where they have studied in one of the previous study periods or where they have done the case study. In most cases, data collection and other fieldwork are elaborated in the home country or a developing-country. The panel learned that the students are satisfied about the preparation for and guidance given during the thesis.

The panel states that this attractive programme is also supported by a well-qualified and research-active staff of good quality and sufficient numbers. The staff numbers are adequate. the high number of guest lecturers with specific expertise stands out as a particular strong point. This use of visiting professors is very much appreciated by the panel, as IMRD-Atlantis clearly makes use of a wide pool of professors with international experience.

Concerning the quality of the staff, the panel notes that the programme is delivered by a well-qualified and research-active team of staff members, who frequently collaborate on projects and papers. The staff are certainly of a high level in the European universities, as is clear from the publications the panel studied. Staff quality is also expressed in the fact that there are joint PhD-projects. The international visiting professors

give guest lectures to illustrate rural development problems, theories and solutions from their regional perspective. This proves to be a major opportunity to open up students' visions of the possible outcomes of rural development policies and solutions in different contexts. Also, the quality of the teaching is aligned to academic standards. The students note that the teachers are easily accessible. Concerning didactic qualities, each university involved has its own range of teacher training sessions. The panel suggests that more extensive exchanges in teacher training across the different universities could be beneficial: presenting good practices to each other could be easy and very helpful.

As this programme requires much more administration than a single -institute programme, the consortium has opted for the creation of one central secretariat, and a local support secretariat at every partner institution. The Central Secretariat at Ghent University presently has 2 full -time and 1 half -time staff member with international experience in project management and international student care and selection. Each module offered in the programme is offered independently by the organising institute, which has its own procedures and policies regarding staff appointments. The panel praises the fact that, given the complexity of the organisation, all the administrative processes run smoothly.

Concerning the student intake, the initial academic admission to enter IMRD is based on a combination of factors including academic degrees and records, a statement of purpose, letters of recommendation, test scores, language skills and relevant work experience. Also considered are the appropriateness of applicants' goals to the IMRD programme. The minimum graduate admission requirements are: English proficiency level of minimum B2, a Bachelor's degree of minimum 3 years with good overall scores from a university or recognised equivalent. Candidates are expected to have basic science training in mathematics and/or statistics, agronomy and/or biology and/or environmental sciences, and social sciences and/or rural development and/or economy. The panel has no remarks about these intake requirements. The application procedure strengthens the confidence of the panel in this programme. Applications are opened at the end of September or at the beginning of October. Different deadlines apply, the earliest being the deadline for scholarship students (mid-January). Applicants must use an online application system after which they are assessed and rejected or admitted by the MB. Once admitted, they must send hardcopy legalised proof of their academic online statements by sending a signed hardcopy application file to the Secretariat. Applicants

receive a Provisional Admission Letter. A Final Admission Letter is only issued upon receipt of the tuition fee. The IMRD programme can count on a diverse international annual intake of 20 to 30 students. About 10 students are funded through an EM scholarship; the other students are self-funding (often with an external scholarship). Most students have a Bachelor's degree or a recognised equivalent academic degree of 3 to 4 years of study in bioscience engineering or agricultural sciences.

The material facilities deserve the appreciation of the panel. At Ghent University, all the facilities are sufficient to enable the students to achieve the targets. In combination with the other universities involved abroad, the panel appreciates the facilities, especially in the context of the good organisation of the case studies and the master's theses. The students are also satisfied, as the student evaluation confirms that the facilities are valued by the students.

Other facilities, such as the support and guidance of the students, are also positively evaluated by the panel, although some remarks can be made concerning the provision of information about different aspects of the programme, both before entering the programme and during the trajectory. Especially in the first phase of the programme, more attention to student guidance is needed. At least one month before their arrival in Ghent, students receive a welcome pack, with all practical information on how to prepare for their journey to Europe. Once enrolled, the central secretariat informs students about timely registration at other universities, sends letters of support for visa applications, scholarship applications and assists with preparation for travel and enrolment.

The panel wants to point out a problem concerning the language requirements. Students are not always informed properly and in time that a high level of French is needed. More effort is necessary to inform the incoming students about these requirements, in order to prevent problems in the learning paths of the students. The local secretariats contact the students to arrange arrival and housing. since all students start the Entrance Module at UGent, the first semester is crucial for both students and programme organisation, with respect to students' guidance and their foreseen personal learning path. During the first semester, substantial effort and time is put into group and individual sessions to outline the programme and to help students find the best way to achieve their (and the programme's) goals. During the subsequent semesters, students will have private meetings with the local (technical) coordinator to check on

their progress and learning path. Additional information is also provided through the Student Handbook.

The students are relatively free to compose a programme relevant to their needs and interests. The panel, however, recommends that, especially in the initial phase of the programme at Ghent University, a more proactive approach is necessary to offer students guidance about their course choices and get them thinking about possible career options. The panel is of the opinion that more active student guidance is necessary, in order to stimulate thinking about their choices and the consequences of these choices on their career.

The panel observes adequate coherence in the learning environment, in the relations between the students, support staff, teaching staff, the programme and the different involved universities. In spite of the challenges presented by the cooperative nature of the programme, a coherent learning environment is provided. The panel praises the way this coherence is monitored, through sufficient reflection and consultation of the different partners. By means of regular management board meetings, the managers of the programme do a good job in keeping the curriculum coherent, despite the challenges of organising a programme with so many partners. This also results in a high level of satisfaction on the part of the students. However, the already mentioned freedom of students in composing a programme in relation to their needs and interests poses a threat to the coherence of the programme of individual students. The panel considers it necessary to be more vigilant in this context. The balance of the study load indicates a positive picture. Students state that the programme is heavy, but doable, with an adequate balance of the study load across the curriculum.

The internal quality control systems of the partner universities form the first step in the Internal Quality Assurance system of IMRD-Atlantis. The MB checks the quality control by evaluation and the feedback of students and scholars through its own IMRD-Atlantis -specific questionnaires. The Internal Quality Assurance system has also resulted in an external tool for quality control. Especially in the context of the European partners, the internal quality control systems satisfy the panel, although there was a gap in information about the organisation of quality control at the affiliated partner organisations, especially those of the third world countries. Concerning the follow-up of the remarks of the previous assessment panel, the managers of the programme did a very good job. All recommendations have been followed up adequately.

In conclusion, the panel saw an interesting programme, in which the many different partners involved work together in forming a unique curriculum and where the managers of the programme succeed in facing up to the risks that go together with such a complex organisation. the international mobility scheme has clear added value. IMRD-Atlantis makes use of a wide pool of professors with international experience, but more extensive exchanges with regard to teacher training across the different universities could be even more beneficial. Information about the required high level of French should, however, be improved, and the relative freedom in composing a programme relevant to the needs and interests of the students, should be monitored more closely, both in relation to future career opportunities and in relation to the coherence of the curriculum.

Generic quality standard 3 - Outcome Level Achieved

The assessment panel evaluates the outcome level achieved for the International Master of Science in Rural Development as good

The panel is of the opinion that the students achieve the formulated learning outcomes. Concerning the vision and policy on testing and examination, the panel is satisfied. The vision on assessment and examination within IMRD-Atlantis is in line with the Internal Quality Assurance System. In the first instance, partners in the consortium are responsible for the validity, reliability and transparency of the assessment and examinations. The MB maintains an overview of assessment and examination, in principle for all courses, and in particular for the case study and the master's dissertation. Principally, the individual lecturer(s) or teams are responsible for a valid and reliable evaluation. the IMRD exam commission also maintains an overview of whether a student has passed all courses in his/her programme and hence has acquired the learning outcomes.

The MB is also responsible for the use of a conversion table for the marks between the different universities. By means of this table, the marks for individual courses are translated into the UGent system. First, the scores of the institutes are collected and the average score and distribution of scores is calculated and compared over the different institutes, based on the ECTS division. Based on the ECTS distribution the original scores are translated to the Ghent score, based on the cumulative percentage so that the average marks and distribution of marks of the different institutes are comparable. The panel is of the opinion that this conversion scale is robust. It was a major challenge for IMRD-Atlantis partners to develop a

system to harmonise different assessment systems used in the partner institutes. The primary concern in developing this system was to keep the strengths of the individual assessment systems used, while ensuring equal treatment of students. The panel is of the opinion that the managers of the programme have succeeded in this challenge: the grading is fair and transparent across the different universities.

The variation in assessment methods is adequate and appropriate to achieve the learning objectives. Students are confronted with different assessment systems (classic exams, assessments of individual and group assignments, presentations, group work, etc.). Written exams are the most commonly used evaluation method, yet students are also evaluated on the basis of assignments and oral exams. Reports, skills tests, participation and presentations are only used in a minority of the courses. The panel observed that the different evaluation methods are also closely linked to the different learning outcomes.

Concerning the transparency of the evaluation and feedback, the panel as well as the students are positive. At course level, transparency about how courses will be assessed is provided by the lecturers. These assessment methods are described in clear course ECTS-files. During the entrance module, the students are acquainted with the assessment methods, with an introduction during the welcome days and by the student counsellor. For most courses, examples of exam papers or assignment papers are made available. This results in clarity about what is required of the students. Feedback moments are organised in line with the regulations of partner universities and in accordance with the availability of lecturers. However, students often indicate that they would like more feedback moments during the academic year and after exams.

The evaluation of the master's thesis follows the rules at the institute of the promoter, but the marking is based on a common evaluation form specifically designed for IMRD-Atlantis. The on-going modus operandi of a joint assessment of the master's dissertation, by both the standard local master's dissertation jury members and an additional external jury member, also provides reassurance as to the common quality standards of the IMRD research output. The external jury member is chosen at a MB meeting. A uniform IMRD-Atlantis evaluation form is used to combine the scores of the local jury and the external jury member. A subsequent standard form for the calculation of the final thesis marks has been developed, as a further refinement to the common thesis assessment

procedure. The final mark is given by the jury, taking the mark of the external jury member into account. The panel is of the opinion that this results in fair scoring, in which the score provides a good representation of the level of the thesis, in line with international standards.

The panel regards the pass rates as adequate, given the challenging factor of international mobility. The drop-out rate is acceptable. So far, four students have discontinued the programme. Completion rates are satisfactory and most students graduate within the foreseen 2-year timeframe. Students participating in the ATLANTIS programme generally take longer to graduate: about 50% of the students graduate within two years. A minority of the students takes three years to graduate. The panel considers the graduation rate within two years as open to improvement, but given the complicated nature of the programme, the panel is of the opinion that the graduation rate is acceptable. The panel appreciates the fact that in case of failure or underachievement (in particular in the case of scholarship students) measures are taken. The Study results and progress of all students are discussed at the MB (Management Board) meetings. The MB can permanently discontinue scholarship payments after consultation with the EU.

In the context of employability, an alumni survey was conducted in 2011 to gain a better insight into the career choices of the students after graduation. The panel appreciates this initiative. At their enrolment, a high number of students seem to view IMRD as an intermediate step in their academic career. Many look for PhD opportunities after graduation. Out of the 100 respondents, 29% have started a PhD programme, either at the partner universities, or at other universities worldwide. Together with the alumni association, a website has been constructed, where alumni can update their career information and curriculum vitae. The majority of graduates have the possibility to return to their previous employment (in particular the students who were employed as assistant professors or researchers at universities). More information about the activities of the alumni, and their contribution to the programme, could be beneficial. An alumni survey (2011) gives professional perspectives about the programme and the panel appreciates the fact that another round of the survey is planned. Alumni from the USA and European students appear to have more difficulties in finding a job than students in developing countries, but in general, graduates seem to be able to find good job opportunities. The panel regards it as evident that employability can be assessed as good.

In conclusion, the panel assesses the programme as satisfactory in terms of vision and policy, fair and transparent grading across the different universities, and the variation in assessment methods, appropriate to achieving the learning objectives. The panel also concludes that the scoring of the master's thesis is representative of the level, which is up to international standards. Concerning the pass rates and the drop-out, the panel is positive, given the challenging course structure. Finally, employability can be assessed as good, but the panel advises that links with the professional community should be strengthened and PhD students' career paths monitored. More information about the activities of alumni and their contribution to the programme could be beneficial.

Final judgement of the assessment panel

Generic quality standard 1 – Targeted Outcome Level	E
Generic quality standard 2 – Learning Process	E
Generic quality standard 3 – Outcome Level Achieved	G

As Generic quality standard 1 is evaluated as excellent, Generic quality standard 2 is evaluated as excellent and Generic quality standard 3 is evaluated as good, the final judgement of the assessment panel about the International Master of Science in Rural Development is good, according to the decision rules.

Summary of the recommendations for further improvement of the study programme

Generic quality standard 1 – Targeted Outcome Level

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Generic quality standard 2 – Learning Process

– Monitor more closely the large degree of freedom given to students in constructing their own programme, especially in the initial phase of the programme at Ghent University; optimise the guidance given to students concerning their course choices with a view to possible career options.
– Encourage the exchange of good practices in teaching methods and course design between staff of the cooperating universities and strive for more extensive exchange in teacher training across the different universities (present good practices to each other).
– Pay more attention to student guidance, especially in the first phase of the programme.
– Inform incoming students about the required high level of French, in order to prevent problems in the learning paths of the students.

Generic quality standard 3 – Outcome Level Achieved

– Optimise the amount of feedback during the academic year and after exams.
– Strengthen the links with the professional community and follow PhD students' career paths; provide more information about the activities of the alumni, and their contribution to the programme.

UNIVERSITEIT GENT
Master of Science in Nutrition and Rural Development

SUMMARY
Master of Science in Nutrition and Rural Development
Universiteit Gent

From 20 to 22 May 2014, the Master of Science in Nutrition and Rural Development at UGent has been evaluated in the framework of an educational assessment by a peer review panel of independent experts. In this summary which describes a snapshot, the main findings of the panel are listed.

Profile of the programme

The Master of Science in Nutrition and Rural Development aims to train specialists capable of functioning in a multidisciplinary team and of outlining, implementing and evaluating integrated policies, adjusted to the specific needs and possibilities of developing countries. The students are trained in scientific and applied research in fields related to their main subject and major. Their education should contribute to sustainable rural development, guaranteeing food and nutrition security and eradicating poverty and inequality.

The programme has three specialisations: Human Nutrition, Rural Economics and Management, and Tropical Agriculture.

Programme

The programme counts 120 ECTS and consists of two years. In the first semester of the first year, basic courses are given to guarantee that all required fundamental, in-depth and high-level knowledge has been acquired by each of the students coming from diverse educational backgrounds. These courses amount to 30 ECTS. In the following semesters, more main profile-specific knowledge is transferred, combined with a number of intra-disciplinary common courses depending on the main profile and major chosen. During the third and fourth semesters, students follow the disciplinary specialised courses they have chosen to fine-tune their programme in addition to the obligatory/standard courses. Throughout this period they work on their master's thesis.

The programme has some room for elective courses: 10 ECTS for Human Nutrition, 15 ECTS for Tropical Agriculture and 20 ECTS for Rural Economics and Management. As optional course(s) students can choose an internship and extended internship.

The programme involves lectures, guided self-study, group work, coached exercises and independent work. There are differences according to each main subject, but overall around 23% is given as lectures (mainly in the first semester) and 20% as guided self-study. The group work is used for developing communication skills and an attitude to work in a multi-disciplinary manner. Human Nutrition and Rural Economics and Management are more focused on group work, while Tropical Agriculture dedicates about 10% of the curriculum to practicals but has more excursions.

Evaluation and testing

The evaluation methods most used in the programme are 'written exam', 'work', 'oral exam' and 'report', with some differentiation according to the main subject. Tropical Agriculture for instance places more emphasis on 'practical work' as the students have more lab-practicals. Human Nutrition has a high score for written exams, partly because of the larger student numbers.

Overall, written exams are used in a quarter to a third of the evaluations. Peer assessment and portfolios are not used as evaluation methods, although peer review exercises are organised for the master's thesis development. In some course units the lecturer gives examples of exam

questions throughout the semester, or organises pre-tests and mid-term tests with written feedback afterwards. The master's thesis has to be defended in public.

Services and student guidance

A Post Doc has been officially nominated to deliver study counselling activities for all students requesting this service. Permanent assistance is offered by lecturers and assistants through specific contact hours or through e-mail and even through Skype. Students are also supported by a learning path coordinator in the development of their personal programme. At programme level, there is daily assistance from a scientific and administrative coordinator. The scientific coordinator fulfils the role of ombudsperson.

A recently created International Training Center is currently optimising the organisational framework for study counselling, dealing among other things with student support, alumni policy and campus interaction among students and staff.

All courses are taken in the Faculty, except the practicals for animal production. The infrastructure is adequate but rather old fashioned. At the Faculty, a central library is available, while some departments still maintain a smaller library.

Study success and professional opportunities

The programme has had a number of low-performing students, continuing for several years. Since the academic year 2013–2014, a more stringent procedure has been implemented to avoid such situations. This seems to have had an immediate effect. The progression rate is rather unequal over the three specialisations. Between the start of the programme in 2007–2008 and 2013, 81% of Human Nutrition students obtained the degree within 2 years. For Rural Economics and Management and Tropical Agriculture the numbers are, respectively, 63% and 74%.

Information on employability is somewhat scarce. An International Training Centre has started organising a data bank for foreign alumni.

ASSESSMENT REPORT
Master of Science in Nutrition and Rural Development
Universiteit Gent

Preface

This report concerns the Master of Science in Nutrition and Rural Development at Universiteit Gent (UGent). The assessment panel visited the study programme from 20 to 22 May 2014.

The panel assesses the study programme on the basis of the three generic quality standards (GQSs) of the VLUHR programme assessment framework. This framework is designed to fulfil the accreditation requirements set by the NVAO. For each generic quality standard, the panel gives a weighted and motivated judgement on a four -point scale: unsatisfactory, satisfactory, good or excellent. In the assessment of generic quality assurance, the concept of 'generic quality' indicates that the GQS is in place and that the programme – or a specific mode of the programme – meets the quality level that can reasonably be expected, from an international perspective, of a Master's programme in higher education. The score 'satisfactory' indicates that the programme meets the generic quality because it demonstrates an acceptable level for the particular GQS. If the study programme scores 'good', the programme systematically exceeds the generic quality for that standard. If the programme scores 'excellent', it achieves well above the generic quality for the particular GQS and serves as an (inter)national example. The score 'unsatisfactory' indicates that the programme does not attain the generic quality for that particular GQS.

The panel's opinions are supported by facts and analyses. The panel makes clear how it has reached its opinion. The panel also expresses a final opinion on the quality of the programme as a whole, also according to the same four-point scale. Judgements and recommendations relate to the programme with all subordinate modes or majors, unless stated differently.

The panel assesses the quality of the programme as it has been established at the time of the site visit. the panel has based its judgement on the self-evaluation report and the information that arose from the interviews with the programme management, lecturers, students, alumni and personnel responsible at programme level for internal quality assurance, internationalisation, study guidance and student tutoring. The panel has also examined the course materials, master's theses, test and evaluation

assignments and standard answering formats, and numerous relevant reports available. For the student success rate, the panel has relied on the data provided by the programme management. The panel has also visited specific educational facilities such as classrooms, laboratories and the library.

In addition to its judgement, the panel also formulates recommendations with respect to quality improvement. In this manner, the panel wants to help improve the quality of the programme. The recommendations are included in the relevant sections of the respective generic quality standards. At the end of the report an overview is given of improvement suggestions.

Context of the study programme

The master of Science in Nutrition and Rural development consists of 120 ECTS credits, spread over two years. The programme (all variants) has 89 students enrolled (2012–2013). The Master of Nutrition and Rural Development is organised within the Faculty of Bioscience Engineering of UGent. The faculty is also responsible for numerous master's programmes in the field of Bioscience and Bio-Engineering.

The programme has three specialisations: Tropical Agriculture, Rural Economics and Management and Human Nutrition. Each specialisation is supported by different departments of the Faculty of Bioscience. The departments and their associated teachers are responsible for the content of education in the courses.

The programme started as a training programme with a focus on human nutrition (1970), and became a 1-year programme in 1987, later on officially recognised as Complementary Studies in Food Science and Nutrition (1998–1999). The Rural Economics and Management programme and Tropical Agriculture programme started as a 2-year programme in 'Landbouwontwikkeling' (Agricultural Development). It was recognised as a GAS/GGS in 1998–1999. In Late 2006 it became clear that splitting the Agricultural Development programme into a more technical part ('main subject' – Tropical Agriculture) and a more governance -oriented part ('main subject' – Economics and Management) would enable the Faculty to better respond to the needs of international society. In line with the Bologna and Sorbonne Declarations, all Complementary and Specialised programmes organised by the Faculty of Bioscience Engineering were

transformed to the Bachelor-Master model with the intention of making the programmes internationally recognisable and compatible. the existing Complementary Studies in Food Science and Nutrition and Agricultural Development were therefore integrated as subjects in the newly created 2-year Master of Nutrition and Rural Development.

The programme is managed by the coregroup, consisting of the course directors, student representatives of the three specialisations and course coordinator. All matters related to content and students are discussed. The Core group also acts as a bridge between the Faculty and all type of employers (government, industry, higher education institutions, research centres and national and international non-governmental organisations). The ultimate responsibility for the organisation of the education lies with the Faculty Council.

Generic quality standard 1 - Targeted Outcome Level

The assessment panel evaluates the targeted outcome level as unsatisfactory.

Food Production, Nutrition and Rural Development remain important issues at world level as illustrated by the 5 strategic objectives of the Food and Agriculture Organization of the United Nations (FAO). Solving these problems requires highly skilled multidisciplinary people who are able to combine scientific knowledge with technical and practical skills to develop, implement and follow-up diverse development programmes.

The Master of science in Nutrition and Rural Development aims to train specialists capable of functioning in a multidisciplinary team and of outlining, implementing and evaluating integrated policies, adjusted to the specific needs and possibilities of developing countries. The students are trained in scientific and applied research in fields related to their main subject and major. Their education should contribute to sustainable rural development, guaranteeing food and nutrition security and eradicating poverty and inequality. The management aims to provide a high quality programme for **increasing food and nutrition security and alleviating poverty and rural development problems**. Solving these problems requires highly skilled multidisciplinary specialists who are able to combine scientific knowledge with technical and practical skills to develop, implement and followup diverse development programmes. The programme has **three specialisations**: Human Nutrition, Rural Economics and Management, and Tropical Agriculture.

The programme management has defined a number of **skills** that are **common to all three main specialisations**. The idea is that its graduates (1) acquire the necessary basic knowledge, insights and capabilities (attitudes and know-how) in the areas of production, post-harvest handling, transformation, preservation, marketing and consumption of food products; (2) are familiar with qualitative and quantitative research methods and analyses in the field; (3) are able to identify problems and explore and rank causes, in order to be able to plan and implement/manage suitable interventions; (4) possess both written and oral communication skills to enable them to communicate with specialist and non-specialist audiences; (5) are capable of conducting independent scientific research and (6) have an attitude of life-long learning.

Apart from these six common skills, more specific learning outcomes have been defined per main specialisation. As a whole, the programme learning outcomes comply with the Flemish qualification framework as well as with the discipline-specific framework. Based on the self-evaluation report, the documentation available for inspection and the interviews, the panel notes that, despite its profile as an interdisciplinary and multidisciplinary programme, there is a pronounced separation between the three options. The way the programme-specific learning outcomes are formulated reinforces the impression that three specialisations have been created whose content is mutually independent. The fact that VLIR UOS only supports the Human Nutrition specialisation in the context of university development cooperation reinforces this impression.

The programme is described by its management as 'unique in its focus, content and level'. The programme has good international contacts, has been recognised by various bi- and multilateral organisations and is aware of international trends and the changing policy agenda. The SER for instance refers to the five strategic objectives of the FAO. Nevertheless, better use could be made of these good international contacts. There is **little evidence of input** from potential employers (for instance through an advisory board) about what they require from graduates or see as relevant learning outcomes. The Tropical Agriculture profile in particular is still organised according to disciplinary principles. Based on the self-evaluation report, the additional documentation and discussions, the panel concludes that the programme management has not yet put enough effort into the national and international benchmarking of the programme's learning outcomes. Such benchmarking training offers the potential to strengthen the programme's profile on the basis of facts and figures. A

full and thorough benchmarking exercise provides a lot of information for the further profiling and positioning of the programme both at home and abroad, and offers opportunities to communicate graduates' profile in a clear manner to the employment market. This need for more attention to benchmarking also includes stronger involvement of the alumni and employers. The panel is of the opinion that here too opportunities are being missed to strengthen the objectives and the programme.

A point of attention, mentioned by the SER itself, is that not all academic staff members are well acquainted with the learning outcomes. It seems that the learning outcomes are not yet incorporated into the learning process, in particular with regard to Tropical Agriculture.

Based on the above findings, assessments and arguments, the panel considers that there are insufficient generic quality assurances with respect to the intended learning outcomes. The panel believes that the programme-specific learning outcomes are insufficiently attuned to the profile of the programme. The panel takes the view that due to the lack of inter- and multidisciplinarity in the programme-specific learning outcomes and the lack of proper benchmarking, there are insufficient guarantees that the programme-specific learning outcomes are consistent with the current requirements of the professional field and the discipline with regard to the content of the programme from an international perspective. The panel therefore considers it necessary for the programme management to hold thorough discussions on the profile of the programme and associated clear learning outcomes. The integrational character of the programme needs to be firmly based in both the profile and the programme-specific learning outcomes.

Generic quality standard 2 – Learning Process

The assessment panel evaluates the learning process of the Master of Science in Nutrition and Rural Development as satisfactory

The programme consists of 120 ECTS. The three specialisations (Human Nutrition, Rural Economics and Management, and Tropical Agriculture) have five courses in common (together 23 ECTS). These **common courses** are: 'Applied Statistics', 'Human Nutrition', 'Development Economics', 'Rural Development and Agriculture' and 'Scientific Reading, Writing and Presentation Skills'. Another 7 ECTS are given in joint for Human Nutrition and Tropical Agriculture. Three courses (15 ECTS) are joint to Rural

Economics and Management, and one course is communal to Human Nutrition and Plant Production (a major of Tropical Agriculture). Finally 15 ECTS are common between Rural Economics and Management and Human Nutrition, major Nutrition Security and Management.

In **the first semester of the first year**, basic courses are given to guarantee that all required fundamental, in-depth and high-level knowledge has been acquired by each of the students coming from diverse educational backgrounds. These courses amount to 30 ECTS. The panel observed that students experience the first semester, which is largely theoretical in content, as challenging. In the **following semesters**, more main profile-specific knowledge is transferred, combined with a number of intra-disciplinary common courses depending on the main profile and major chosen. During the third and fourth semesters, students follow the disciplinary specialised courses they have chosen to fine-tune their programme in addition to the obligatory/standard courses. Throughout this period they work on their master's thesis (30 ECTS). The second year is still evaluated as intensive, as students have to work on their master's thesis and complete course work.

The programme has some room for **elective courses**: 10 ECTS for Human Nutrition, 15 ECTS for Tropical Agriculture and 20 ECTS for Rural Economics and Management. As optional course(s) students can choose an internship and extended internship (5 or 10 ECTS). Overall, the breadth of the programme is seen as an asset. Some students, however, have signalled that the number of elective courses that can be chosen from remains relatively low. Apparently there are not enough (relevant) courses in English available at university level for more choice. A recent student evaluation showed that 18% of the Human Nutrition students 'strongly disagreed' that the acquired knowledge and skills are more complex than those of their preceding bachelor. This means that for some students there is considerable 'repetition'. During the interview with the assessment panel, students expressed their desire to specialise more in such topics as econometrics and advanced statistics, qualitative methods, or clinical nutrition. With regard to Human Nutrition, the panel signals that on the topic animal production is somewhat undervalued in the current curriculum.

Given the current learning outcomes, the panel finds the programme, although somewhat complex and difficult to oversee, sufficiently structured. It is clear that in the first semester the knowledge of the

students – who come from very diverse backgrounds – is standardised. From the second semester onwards, courses become more specialised, and show a more applied approach. Over time, the teaching formats become more varied and the ex-cathedra part is gradually switched to analyses and evaluations. Asked about the variation in teaching methods and activities, students responded positively overall in the most recent programme evaluation. Also in the meeting with the assessment panel, it turned out that students are satisfied with the group work, exercises and projects. The first semester however, with a lot of ex cathedra lecturing, is less appreciated. A lot of courses still appear to be monodisciplinary. However, students and alumni told the panel that they perceive **interdisciplinary aspects** in the common courses, in the sense that different angles are brought together and they get involved in group work with fellow students from different backgrounds. However, the assessment panel is not fully convinced. The panel recommends a stronger emphasis on interdisciplinarity within the learning content. The panel can already see possibilities for strengthening the common component of the programme. The panel considers the use of case studies from different domains (e.g. 'Applied Statistics' with examples from food science, food technology, aquaculture and environmental sciences, etc.) to be insufficient to guarantee interdisciplinarity.

Regarding **teaching methods**, the programme involves lectures, guided self-study, group work, coached exercises and independent work. There are differences according to each main subject, but overall around 23% is given as lectures (mainly in the first semester) and 20% as guided self-study. The group work is used for developing communication skills and an attitude to work in a multi-disciplinary manner. Human Nutrition and Rural Economics and Management are more focused on group work, while Tropical Agriculture dedicates about 10% of the curriculum to practicals but has more excursions. The **course material** is adequate, and it is an asset that staff research papers are included in it. Still, in some cases the course material seems less well organised and more complete and more consistent course outlines are required. **E-learning** modules have been developed to support teaching or even replace ex-cathedra courses. The electronic learning platform Minerva is also used to stimulate discussions among students, but in practice it has not led to real debates yet. It appears that students appreciate e-learning, but only if it remains in combination with classes.

According to the SER, enlarging the **internship** programme has been expressed as 'top priority' by both alumni and students. Students also told the panel that they lack guidance for their choice of internship.

The **master's thesis** is worth 30 ECTS. Already in the second semester of the first year, students produce a discussion paper on their future thesis research in 'Scientific Reading, Writing and Presentation Skills'. Some professors allow students to come up with own research initiatives; others request that they integrate their master's dissertation topic with the on-going research at the Department or in the research unit of the professor they contacted. The panel appreciates the fact that quite a number of students do a field study and go back to their home country to collect data. In the first week of the semester, students are informed about the procedures of the master's thesis. They are assigned a promoter and possibly a tutor, who are responsible for the day to day support. Critical deadlines are presented in the process, e.g. submitting the topic, protocol development, fieldwork. Guidelines on the format and timing are provided by the faculty website. Students value the guidance provided in connection with the master's thesis.

Interested **future students** can apply through the programme website. Non-Belgian degree holders must have at least an academic bachelor's degree of minimum 3 years with good overall scores. There are general academic prerequisites too, viz. adequate knowledge of mathematics, statistics and computer science, and particular prerequisites for each main subject. Foreign, non-native speakers must be able to prove their proficiency in English. The academic and English requirements are evaluated electronically. Applications are screened for academic eligibility by the central student administration. Scholarship applications for the VLIR scholarship programme are only applicable for the Human Nutrition specialisation. This has a significant impact on the socio-economic profile of the incoming students in the different majors. The great majority of the students are non-European and originate mainly from Africa and Asia. Of all the students starting the programme, half already have a master's degree. Many of the newcomers also have a minimum of two years' work experience in diverse working environments. Given the progression rate and the overall level of alumni *(see GQS 3)*, the intake policy can be considered as adequate. Most of the students select Human Nutrition, and less of them selectTropical Agriculture. The committee therefore recommends that attention should be paid to the intake policy of the different majors, keeping the differences between the majors (in terms of numbers, socio-economic background, financing, etc.) manageable.

New students coming to Ghent who feel uncertain about their abilities can follow a **summer school** that offers refresher courses in mathematics, statistics and organic chemistry. A pre-test of statistics (through computer)

is available too. For newcomers there is also a welcome day and recently a **buddy system** has been set up.

The ICP character of the programme is reflected in the composition of students as well as in the curriculum. With regard to **local capacity building**, the panel has the impression that this remains limited. New initiatives to set up similar centres of excellence should be encouraged.

The **staff** of the programme can be divided in lecturers (ZAP), assisting staff (AAP) and post-doctoral researchers (PDA). All ZAP involved in the programme have multiple tasks: education, research and service rendering. Most of the AAP and PDA help lecturers with the practical sessions of the teaching programme, guidance for personal and group tasks, tutoring master's thesis students, correcting exams, evaluation of reports and so on. Half of the teaching staff have taken basic teacher's training. The leading lecturers in the main subjects are all from the same faculty, which should facilitate coherence and coordination. Most lecturers have a background in Agricultural Engineering. A majority have **international experience** through projects in developing countries, research activities or prolonged work contracts overseas. Practical experience abroad and involvement in international projects are specific requirements to be recruited. Having experiences in developing countries is not a must for certain courses but can be an advantage. Effort has been put (since the last assessment in 2006) into attracting more guest speakers. Overall the panel is satisfied with the **staff quality**. However, a few remarks were heard that require follow-up. Some students complained to the panel about the quality of courses taught by Post Docs. This problem is known and has been addressed by the faculty. Although all UGent professors involved in the programme have obtained minimum a C1 level on an English test, another complaint dealt with the level of English of some lecturers. The panel advises the programme management to work on creating targeted training provision.

Human Nutrition counts 20 lecturers and 14 assistants, Rural Economics and Management 11 lecturers and 12 assistants, and Tropical Agriculture 21 lecturers and 16 assistants. These **staff numbers** are certainly sufficient.

A Post Doc has been officially nominated at the Faculty to deliver **study counselling** activities for all students requesting this service. According to the SER, more and more students make use of this service, mostly to help them to get acquainted with more efficient study methods or to receive

extra explanation of certain elements in the common courses. Students especially tend to contact the Counselling service after the exams of the first semester. In addition to this, permanent assistance is offered by lecturers and assistants through specific contact hours or through e-mail and even through Skype. Students are also supported by a learning path coordinator in the development of their personal programme. At programme level, there is daily assistance from a scientific and administrative coordinator. The scientific coordinator fulfils the role of ombudsperson. If problems cannot be solved, students are sent to the Faculty ombudsperson. A recently created **International Training Center** is currently optimising the organisational framework for study counselling, dealing among other things with student support, alumni policy and campus interaction among students and staff. The panel wishes to express its appreciation of the effort the programme management is putting into student guidance within the programme.

All courses are taken in the Faculty, except the practicals for animal production. The **infrastructure** is adequate but rather old fashioned. Lecture rooms are equipped with blackboards, beamers and screen. At the Faculty, a central library is available, while some departments still maintain a smaller library.

With regard to **internal quality assurance**, a coregroup meets regularly. This group comprises the course directors and class representatives of the three main subjects, the course coordinator and invited persons according to the agenda. All matters related to content and students are discussed. The core group also acts as a bridge between the Faculty and all types of employers. It seems to work well, although some meetings have recently been held during classes. Care should be taken to avoid this in the future. According to the SER, various **improvement measures** have already been taken since the start of the programme in 2007. The fact that such restructuring and reorganisation have been applied, means that there is follow-up. The panel also highly appreciates the honest reflection on the programme in the SER, although the structure of the report could have been better and in some cases relevant information was scarce. The panel has learned that at university level regular course evaluations take place, as well as a bi-annual programme evaluation. Valuable as they might be, the panel also finds it appropriate to introduce a regular **programme evaluation** by the Coregroup itself. Such a questionnaire can deal with topics more directly linked with the study programme and generate more timely and useful feedback.

In conclusion, the panel is of the opinion that, given the current learning outcomes, the programme is adequately structured, with a sufficient variety of teaching methods. The intake policy is adequate. Overall the panel is satisfied with the staff quality and the international experience of the staff, although there is some concern about the quality of courses taught by Post Docs. Some other matters of concern remain. The interdisciplinary character must be made more explicit and visible in the programme, students should have more guidance when choosing electives, and there is a low input of students in Tropical Agriculture in combination with a very low student satisfaction.

Generic quality standard 3 – Outcome Level Achieved

The assessment panel evaluates the outcome level achieved as satisfactory.

Since the start of the programme, teachers have organised examinations based on their own expertise. Several members of the ZAP and AAP have also followed specific training organised by Ghent University. Within the Faculty a process has been initiated to (1) make testing and examination transparent within a framework of permanent quality assurance and (2) evaluate where needs and improvements can be made. In addition, a checklist has been made containing tasks and responsibilities in relation to **testing and examination**. Important points are validity, reliability, transparency, feedback, honesty and diversity.

According to the SER, the **evaluation methods** most used in the programme are 'written exam', 'work', 'oral exam' and 'report', with some differentiation according to the main subject. Tropical Agriculture for instance places more emphasis on 'practical work' as the students have more lab-practicals. Human Nutrition has a high score for written exams, partly because of the larger student numbers. Overall, written exams are used in a quarter to a third of the evaluations. Peer assessment and portfolios are not used as evaluation methods, although peer review exercises are organised for the master's thesis development. The examination is **transparent**: it is clear to students what is expected from them. All lecturers explain and clarify the evaluation methods used during their lectures and on their ECTS-files. In some course units the lecturer gives examples of exam questions throughout the semester, or organises pre-tests and mid-term tests with written feedback afterwards. According to the SER, a majority of the students would prefer to take more oral exams and fewer written exams.

The panel has viewed a selection of exam questions and finds their quality satisfactory, although there is room for improvement. Exam questions sometimes have 'model answers', but this is not generalised. More effort could be put into testing the interdisciplinarity element of the programme. Overall, the panel also notes the absence of any behavioural evaluation of the students on the work floor.

Evaluation of the **master's thesis** is based on the written manuscript and a public defence. The evaluation committee consists of a chairman and secretary, the promoter(s) and the tutor(s) as one vote, and two readers. All are present at the oral defence. The evaluation criteria are clearly defined and listed on the evaluation forms for the respective members of the evaluation committee. The chairman and the secretary do not take part in the evaluation, but are responsible for place the marking of each student in the overall context of all thesis presentations. This ensures that the marking is put in perspective. After deliberation, feedback is given by the chairperson to the student. The assessment panel has read a sample of 12 recently written master's theses. According to the panel, the quality of the master's theses is adequate, and consistent with the grades awarded. The theses have led to a number of publications in peer-reviewed journals. It is an asset that most theses deal with subjects 'in the field' (mainly the home country of the student). However, the panel would recommend adding a 'helicopter view', a broader analysis, in the dissertations in line with the multidisciplinary nature of the programme. The panel reminds the programme management that this recommendation was also made at the time of the previous assessment, in 2006.

Overall the panel finds that the learning outcomes are achieved. Course materials, master's thesis quality and exams prove that in most cases critical analysis and application skills are reached. According to the SER, no less than 95% of the alumni have declared that their personal expectations were fulfilled by the programme. They underline that the knowledge, know-how and other skills obtained at Ghent University have been the basis for the start of their future career. This positive view has been confirmed by the alumni who spoke with the assessment panel. Alumni who do not start a PhD programme (around 20%) return to their home country. According to the SER, many alumni look for other professional opportunities. They move from government work to research work or field work for international non-profit organisations. Others go back to their education job at universities but succeed very fast in setting up some local projects.

Only 166 students (out of 215) had graduated between the start of the programme in 2007–2008 and the publication of the SER (2013). According to the SER, this rather average figure may be due to 1) several students registering for courses and dropping out before exams and 2) a few low-performing students that remained in the programme. in the last 5 years, the programme has had a number of such low-performing students, continuing for several years. Since the academic year 2013–2014, a more stringent procedure has been implemented to avoid such situations. This seems to have had an immediate effect. The progression rate is rather unequal over the three specialisations. Between the start of the programme in 2007–2008 and the publication of the SER (2013), 81% of Human Nutrition students obtained the degree within 2 years. For Rural Economics and Management and Tropical Agriculture the numbers are, respectively, 63% and 74%. The reason for this may be the difference between scholarship-holders and non-scholarship-holders. However, the panel believes that the programme management should pay attention to student progression and consequently the diploma yield, regardless of the financial situation of students.

The SER claims that students 'are well prepared for their future jobs, find readily employment and an important part of them have obtained a high level of creativity and research skills to continue in a PhD programme'. In an alumni survey, 83 out of 91 respondents confirmed the programme had a 'strong relevance' for their current job. Still, the panel finds that information on **employability** is not sufficient. Although 91 respondents is a good sample, it cannot be fully relied upon. In this respect, the panel is satisfied that the International Training Centre *(see also GQS 2)* will soon start organising a data bank for foreign alumni. Ideally this should be accompanied with an active alumni organisation. The panel recommends the development of quality data management regarding alumni and employment, in support of an evidence-based policy within the programme.

In conclusion, the panel finds that the learning outcomes are achieved. The assessment methods are in general adequate and there is sufficient variety in assessment forms. Master's thesis quality and exams prove that in most cases critical analysis and application skills are reached.

Final judgment of the assessment panel

Generic quality standard 1 – Targeted Outcome Level	U
Generic quality standard 2 – Learning Process	S
Generic quality standard 3 – Outcome Level Achieved	S

As Generic quality standard 1 is evaluated as unsatisfactory, Generic quality standard 2 is evaluated as satisfactory and Generic quality standard 3 is evaluated as satisfactory, the final judgement of the assessment panel about the Master of Science in Nutrition and Rural Development is satisfactory for a limited period, according to the decision rules.

The assessment panel learned that after its visit a new vision, set of learning outcomes, course plan and organisation have been drafted. Several persons from different communities were contacted to join a formal advisory board, to be installed in September 2016.

After the site visit, the programme management has announced a revised and more modular curriculum, emphasising a more integrated approach without major subjects

Summary of the recommendations for further improvement of the study programme

Generic quality standard 1 – Targeted Outcome Level

- Reformulate the learning outcomes into one set expressing the holistic approach across the three profiles.
- Make better use of external input, for instance by introducing an advisory board with representatives from the professional field.
- Benchmark the Tropical Agriculture profile with multidisciplinary Tropical Agriculture programmes in Europe aiming at development.
- Ensure that all staff are conversant with the learning outcomes and apply these in their teaching objectives for courses.

Generic quality standard 2 – Learning Process

- Expand the offer of elective courses and simultaneously reduce the size of the standard programme by critical review.
- Analyse all courses for disciplinary and multidisciplinary content and ensure that teaching staff present their courses to contribute to inter-/ multidisciplinarity as expressed in the learning outcomes.
- Improve the Human Nutrition courses with more applied knowledge and practical skills.
- Consider organising a seminar that integrates the three main profiles of the programme.
- Improve the course materials for completeness and consistency.
- Ensure teaching quality by judiciously allocating Post Docs to teaching courses and ensuring English competency.
- Consider introducing a regular programme evaluation by the Coregroup.
- Pay attention to the intake policy of the different majors, keeping the differences between the majors (in terms of numbers, socio-economic background, financing, etc.) manageable.

Generic quality standard 3 – Outcome Level Achieved

- Put more effort into testing the interdisciplinarity element of the programme.
- Make sure that master's theses reflect the multidisciplinary and holistic nature of the programme.
- Improve the information on employability for students.
- Pay attention to student progression and consequently the diploma yield, regardless of the financial situation of students.

BIJLAGEN

BIJLAGE I
Personalia van de leden van de visitatiecommissie

Wim H. Rulkens is emeritus hoogleraar Milieutechnologie aan Wageningen Universiteit. Hij studeerde aan de Technische Universiteit Eindhoven waar hij in 1966 afstudeerde aan de faculteit Chemical Engineering. Van 1966 tot 1973 was hij wetenschappelijk medewerker bij de vakgroep Fysische Technologie. In 1973 promoveerde hij aan dezelfde universiteit op een poefschrift over het behoud van vluchtige smaak- en geurstoffen bij het drogen van model-voedingsmiddelen. Van 1973 tot 1989 zette hij zijn professionele loopbaan voort bij de Nederlandse Organisatie voor Toegepast Onderzoek TNO. Eerst leidde hij daar de researchgroep Proces- en Productontwikkeling die procestechnologisch onderzoek verrichtte voor de industrie, nadien gaf hij leiding aan het milieutechnologisch onderzoek op het gebied van afvalwaterzuivering, bodemreiniging en verwerking van afvalstoffen zoals zuiveringsslib en mest. In 1989 werd hij benoemd als hoogleraar Milieutechnologie aan Wageningen Universiteit. Als hoogleraar Milieutechnologie en hoofd van de Sectie Milieutechnologie was hij verantwoordelijk voor het onderwijs en onderzoek op het gebied van de milieutechnologie aan Wageningen Universiteit. Het onderzoek van de Sectie Milieutechnologie was gericht op het ontwikkelen van biologische, fysische en chemische technologieën voor het zuiveren van afvalwaterstromen, vervuilde gasstromen, vervuilde bodems en sedimenten en het behandelen van afvalstromen. De focus van het onderzoek en onderwijs verschoof in de loop van de tijd daarbij steeds meer naar preventie van milieuverontreiniging en terugwinnen van waardevolle grondstoffen en energie. Hij was lid van het College voor

Promoties van Wageningen Universiteit. Begin 2008 ging hij met emeritaat. Naast zijn directe werkzaamheden op het gebied van onderwijs en onderzoek heeft Wim Rulkens een actieve rol gespeeld in een groot aantal externe commissies en instanties op het gebied van onderzoeksadvisering en beoordeling van onderzoekprogramma's en afzonderlijke onderzoekprojecten. Hij is o.a. voorzitter geweest van de Adviescommissie InnoWator (SenterNovem, ministerie van Economische Zaken) dat voor de overheid innovatieve projecten op het gebied van waterzuivering moest beoordelen en voorzitter van het Programmacollege Milieu en Technologie (Agentschap NL, ministerie van Economische Zaken, Landbouw en Milieu), dat de overheid moest adviseren over innovatieve industriële onderzoekprojecten op het gebied van de milieutechnologie. Verder is hij betrokken geweest bij een aantal onderwijsvisitaties. Hij was lid van de kerncommissie voor de onderwijsvisitatie van de Bio-ingenieurswetenschappen aan de Universiteit Gent, de Universiteit Antwerpen, de Katholieke Universiteit Leuven en de Vrije Universiteit Brussel (2006), voorzitter van het Initiële Accreditatie Panel voor de beoordeling van het Bachelorprogramma op de Koreaanse Campus van de Universiteit Gent (Bachelor of Science in Food Technology, Bachelor of Science in Environmental Technology and Bachelor of Science in Molecular Biotechnology) en voorzitter van de commissie ter beoordeling van de Toets Nieuwe Opleiding van de professioneel gerichte Bachelor in de Ecotechnologie van de Katholieke Hogeschool VIVES-Zuid.

Akke J. van der Zijpp is hoogleraar (emeritus) Dierlijke Productiesystemen, Department Animal Sciences van Wageningen Universiteit. Zij is gepromoveerd aan Wageningen Universiteit op een proefschrift over genetische resistentie tegen ziekten van pluimvee in 1982. Daarvoor was zij verbonden aan Reading University als lecturer Animal Science en deed onderzoek naar verbetering van de broeduitkomsten van pluimvee. In 1984 kreeg zij een NWO Scholarship voor een advanced study leave immunologisch en moleculair biologisch onderzoek aan Mississippi State University. In 1988 werkte zij bij de onderzoeksbeleid organisatie NRLO in Den Haag en daarna als (adjunct) directeur van de DLO instituten voor Veeteeltkundig Onderzoek en Animal Science and Health. Daarna was zij Deputy Director van het CGIAR institute ILRI en daarna ICIPE in Nairobi. De laatste tien jaar van haar loopbaan zijn gewijd aan onderwijs en onderzoek voor een duurzame veehouderij wereldwijd. Zij was de eerste vice-president van de European Society of Animal Production, President of the International Society of Animal Genetics, voorzitter van de Board van graduate school Wageningen Institute of Animal Sciences, lid van de RAWOO (adviesorgaan van de minister voor Development Cooperation),

Member of the Board of the Animal Health Service in Deventer en van de Scientific Board for Integrated Agriculture and Nutrition. Zij is actief betrokken bij evaluaties van onderwijs en onderzoek van interrnationale organisaties zoals FAO, IFAD, EU, universiteiten en instituten en is lid van Raden van Toezicht voor landbouw onderzoek en NGO's.

Bert Van Loo studeerde af aan UGent in 1970 als Master in de Chemie, met specialisatie in Biochemie. Daarna doorliep hij diverse kaderfuncties in de Brugse productiesite van Gist-Brocades/ International BioSynthetics (IBIS)/Genencor International/Danisco (momenteel DuPont), en kwam zo in aanraking met diverse internationale bedrijfsculturen en fermentatieve producties van enzymen en biotransformaties van chemicaliën op grote schaal onder Ingeperkt Gebruik. Hij Kwaliteitsmanagement, Productie, O&O, en klanten- en overheidsrelaties, om zijn loopbaan te beëindigen als Plant Manager (1999–2008). Na zijn pensionering bleef hij betrokken in het Biotechveld als lid van de Raad van Bestuur van VIB (2001–2007), FlandersBio (2001- …) en Bio.be. Daarnaast was/is hij actief in de Ronde tafel voor Chemie en Bio-energie van essenscia (2006–2008) en als lid van de visitatiecommissie voor Bio-ingenieurs van de VLUHR in 2014.

Isabel Arends is hoogleraar biokatalyse en organische chemie aan de Technische Universiteit Delft sinds 2007. Zij is gepromoveerd (1993) aan de Universiteit van Leiden op het gebied in de fysische organische chemie. Tijdens een post-doc (1994) bij het Nationale Research Council in Canada, heeft zij gewerkt aan oxidatiekatalyse met biomimetische ijzer-complexen. In 1996 ontving zij een fellowship van de Koninklijke Akademie van Wetenschappen, waarmee ze haar eigen onderzoek is gestart aan de TUDelft. Isabel Arends ontwikkelt enzymen om deze te vervolgens toe te passen in de industriële synthese. Haar specialisatie betreft oxidatie-enzymen en artificiële enzymen. Op dit gebied heeft zij vele artikelen, reviews, en boekhoofdstukken gepubliceerd, en meer dan 20 PhDs begeleid. Als universitair (hoofd)docent en later hoogleraar is Isabel Arends reeds jaren actief betrokken bij het onderwijzen en besturen van de opleidingen "Life Science and Technology", en "Molecular Science and Technology" aan de TUDelft. Zij doceert biokatalyse, organische chemie en groene chemie. Momenteel is Isabel Arends voorzitter van de onderzoeksafdeling Biotechnologie, en lid van het management team van de faculteit technische wetenschappen aan de TUDelft. Daarnaast is zij vice-voorzitter van de stichting Technische Wetenschappen in Nederland, en vice-directeur van de post-graduate school biotechnologie in Delft (BSDL).

Kathleen H.L.A. Schlusmans is werkzaam als coördinator kwaliteitszorg bij de Open Universiteit te Heerlen (Nederland) en geeft leiding aan het Expertisecentrum Onderwijs en Professionalisering van de Open Universiteit. Ze is gepromoveerd aan de faculteit Psychologische en Pedagogische Wetenschappen van de Universiteit Gent op het gebied van lerareneffectiviteit. Haar expertise ligt op het terrein van online onderwijs, cursusontwikkeling en onderwijsevaluatie. Haar meest recente publicaties hebben betrekking op informeel leren en op het bevorderen van studiesucces. Katheen Schlusmans was onderwijskundig lid van verschillende visitatiecommissies in Nederland en Vlaanderen en nam van 2009 tot 2014 deel aan de Erkenningscommissie Hoger Onderwijs in Vlaanderen.

Karin Scager is als senior onderwijskundig adviseur werkzaam bij het Centrum voor Onderwijs en Leren van de Universiteit Utrecht. Haar specialiteiten liggen op het terrein van cursus- en curriculumontwerp, kwaliteitszorg, interdisciplinair onderwijs, feedback en beoordeling, en het geven van didactische trainingen en begeleiding van docenten in het Hoger Onderwijs. Voorheen (1985–1991) was zij verbonden aan de Hogeschool van Utrecht. In de Faculteit Gezondheidszorg werkte zij als onderwijskundig adviseur in diverse projecten, lopend van docententrainingen, ontwikkelen van nieuwe opleidingen, cursus- en curriculumverbetering tot het invoeren van systemen voor interne kwaliteitszorg. In de laatste jaren binnen de hogeschool functioneerde zij als interim manager bij de opleidingen Logopedie respectievelijk Verpleegkunde. Zij was acht maal eerder onderwijskundig lid van Vlaamse zowel als Nederlandse visitatiecommissies in Nederland en België.

Gerrit W. Heil is directeur van het bachelor Onderwijsinstituut van de Faculteit Bètawetenschappen van de Universiteit Utrecht. Hij heeft veel ervaring als docent/onderzoeker op het gebied van de landschapsecologie aan zowel de Universiteit van Utrecht als de Universiteit van Amsterdam. Hij was programmaleider van het masterprogramma Natural Resources Management in de Graduate School of Life Sciences, Universiteit Utrecht. In de periode 2001–2006 was hij Onderwijsdirecteur van de faculteit Biologie en gedurende deze periode heeft hij leiding gegeven aan de invoering van de bachelor-masterstructuur van de opleiding biologische wetenschappen van deze universiteit.

Guy Garrod is a Reader in Environmental Economics at Newcastle University and has been Director of their prestigious Centre for Rural Economy since 2010. He is also the coordinator of successful undergraduate programmes in Rural Studies and Countryside Management. He has extensive practical and theoretical experience in the field of environmental economics and rural development, particularly in areas related to the economic valuation of ecosystems services. His experience also includes a range of policy and project evaluation work, including projects for UK Government Departments on agri-environment and forestry policy. Recent studies include work on nine large EU projects, as well as rural development projects in Greece and Chile.

Jaak Lenvain behaalde in 1969 het diploma van Landbouwkundig Ingenieur en in 1975 de graad van Doctor in de Landbouwwetenschappen, beide aan de Universiteit van Gent. Als bodemfysicus was hij achtereenvolgens werkzaam als onderzoeker en lesgever op het Centraal Bodemkundig Instituut te Bogor (Indonesia), op de Universiteit van Constantine (Algerije) en op de Universiteit van Zambia. Hij is auteur van een aantal publicaties op het terrein van de erosiebestrijding en het efficiënt watergebruik bij planten. Zowel in Constantine als in Lusaka droeg hij o.a. telkens bij aan de totstandkoming van een plaatselijk "Master" programma. Vanaf 1990 tot 2000 was hij in de hoedanigheid van Afdelingshoofd programmering werkzaam voor VVOB. Sedert 2001 is Jaak Lenvain werkzaam op de Directie Generaal van BTC in de hoedanigheid van Diensthoofd Kwaliteits-management. In 2009 en 2010 was Jaak Lenvain voor BTC werkzaam in Jeruzalem als verantwoordelijke voor de samenwerking met Palestina. Sedert een tiental jaren was hij in de gelegenheid VLIR-UOS op regelmatige basis bij te staan tijdens selecties en evaluaties van Internationale Cursus en Trainingsprogramma's.

Dietrich Knorr is Professor, Director of the Institute of Food Technology and Food Chemistry since 2001 and Head of the Department of Food Biotechnology and Food Process Engineering at the Berlin University of Technology since 1987. He received an Engineering Degree (Dipl.-Ing.) in 1971 and a PhD in Food and Fermentation Technology from the University of Agriculture in Vienna in 1974. He was Research Associate at the Dept. of Food Technology in Vienna, Austria, Visiting Scientist at the Western Regional Research Centre of the US Department of Agriculture, Berkeley, USA; at the Department of Food Science Cornell University, Ithaca, USA and of Reading University, Reading, UK. He was Visiting Professor at the Association of Biotechnological Research, Braunschweig, Germany,

Associate Professor, Full Professor and Acting Department Chair at the Department of Food Science, University of Delaware, Newark, DE, USA. Prof. Knorr is Editor of the Journal of Innovative Food Science and Emerging Technologies (editor of Food Biotechnology until 2000), Research Professor at the University of Delaware, USA, and Adjunct Professor at Cornell University, USA. In 2004 he got the Marcel Loncin Research Prize of the Institute of Food Technologists (IFT), the Alfred-Mehlitz Award of the German Association of Food Technologists and the EFFoST Outstanding Research Scientist Award. He has published approx. 350 scientific papers and holds 4 patents.

Quinten Van Avondt behaalde in 2014 zijn BSc in de bio-ingenieurswetenschappen aan de Universiteit Antwerpen. Hij vervolgde zijn studie aan de Katholieke Universiteit Leuven om zijn MSc in de bio-ingenieurswetenschappen te behalen. Hierin volgt hij de specialisaties cel- en gentechnologie en bionanotechnologie met een focus op moleculair diagnostische technologie. Tijdens zijn studies aan de UAntwerpen was hij actief als lid van de onderwijscommissie (2012–2014) waarin hij de belangen van de studenten bio-ingenieurswetenschappen vertegenwoordigde. Tijdens zijn studie probeerde hij ook voeling te krijgen met het bedrijfsleven, onder meer door een stage bij de startup Novosanis (2014), waar hij meewerkte aan de ontwikkeling van medische toestellen.

Thomas Alderweireldt is master student Bio-ingenieurswetenschappen aan de Universiteit Gent.

Marie Loveniers is master Bio-ingenieurswetenschappen bio-systeemtechniek aan de KU Leuven.

BIJLAGE II
Reaction to final Programme Assessment Master of Science in Physical Land Resources

The Study Programme Committee of the International Master of Science in Physical Land Resources and all teaching, assistant academic, scientific, technical and administrative staff, and students involved, would like to thank the assessment panel for giving due consideration to our responses to the draft version of the Programme Assessment Master of Science in Physical Land Resources.

We see that most of our requests for reformulating the report have been taken into account and do accept the few instances where this was not the case. We also appreciate that corrections on factual inaccuracies have been made. We also note in the final report that with respect to Generic quality standard 3 – Outcome Level Achieved, the comments made by the panel are primarily positive to very positive. The only points of attention raised be the panel are the existing level of drop-outs and, "though the active alumni policy is clearly a strong point of the programme", the better use of remarks of alumni for new inputs for the programme and for the regional development of the existing networks. As said in our rebuttal, we do this already in as much as possible (in this context, we could even say that in one of the parent programmes, i.e., that on Eremology, several socio-economic courses were part of the curriculum but were removed in the new programme upon request of students and alumni). Even though we will pay due attention to the level of drop-outs, we do not have this fully under control, particularly when students register to the programme for reasons different than academic ones.

Given the positive feedback and that only two points of attention were raised in Generic quality standard 3, we deeply regret that the panel did not reconsider their judgement of that Generic quality standard, leaving it as “satisfactory”. Though the other two Generic quality standards were judges as “good”, the final judgement thus remains “satisfactory”, which we believe does not reflect the quality of our programme, the 2014 programme evaluation by students, the 2013 alumni survey, and, last but not least, the VLUHR assessment report with so much positive feedback.