

EDUCATIONAL ASSESSMENT

Ghent University Global Campus

An evaluation of the quality of the Bachelor of Science in Environmental Technology;
Bachelor of Science in Food Technology and Bachelor of Science in Molecular Biotechnology
at Ghent University Global Campus

www.vluhr.be/kwaliteitszorg

Brussels - May 2020

vluhr



**EDUCATIONAL ASSESSMENT
GHENT UNIVERSITY GLOBAL CAMPUS**

Ravensteingalerij 27
1000 Brussel
T +32 (0)2 792 55 00
F +32(0)2 211 41 99

The report is available electronically at www.vluhr.be/kwaliteitszorg

Legal deposit number: D/2020/12.784/5

PREFACE BY THE VLUHR QA BOARD

The assessment panel reports its findings on the Bachelor of Science in Environmental Technology, the Bachelor of Science in Food Technology and the Bachelor of Science in Molecular Biotechnology at Ghent University Global Campus. These programmes are assessed in the autumn of 2019 on behalf of the Flemish Higher Education Council (VLUHR).

First of all, this report is intended for the programmes involved. This assessment report provides the reader a snapshot of the quality of the programmes and is only one phase in the process of the ongoing concern for educational quality. After a short period of time the study programmes may already have changed and improved significantly, whether or not as an answer to the recommendations by the assessment panel. Additionally, the report intends to provide objective information to a wide audience about the quality of the evaluated programmes. For this reason, the report is published on the VLUHR website.

I would like to thank the chairman and the members of the assessment panel for the time they have invested and for the high levels of expertise and dedication they showed in performing their task. This assessment is made possible thanks to the efforts of all those involved within the institution in the preparation and implementation of the site visit.

I hope the positive comments formulated by the assessment panel and the recommendations for further improvement provide justification for their efforts and encouragement for the further development of the study programmes.

Petter Aaslestad
Chair VLUHR QA Board

	Preface by the VLUHR QA Board	3
	SECTION 1 GENERAL SECTION	
Part I	Educational Assessment Ghent University Global Campus	9
Part II	Table with scores	13
	SECTION 2 REPORT OF THE STUDY PROGRAMME AND SUMMARY	
	Bachelor of Science in Environmental Technology	19
	Bachelor of Science in Food Technology	
	Bachelor of Science in Molecular Biotechnology	
	APPENDICES	
Appendix I	Curriculum vitae of the members of the assessment panel	43
Appendix II	Time schedule of the site visit	47

SECTION 1

General Section

PART I

Ghent University Global Campus

1 INTRODUCTION

In this report, the assessment panel announces its findings with regard to three bachelor programmes of the Ghent University on the Ghent University Global Campus (GUGC): Bachelor of Science in Environmental Technology, Bachelor of Science in Food Technology and Bachelor of Science in Molecular Biotechnology. These study programmes were assessed in the autumn of 2019 on behalf of the Flemish Higher Education Council (VLUHR).

This assessment procedure is part of the VLUHR activities in the area of external quality assurance in Flemish higher education which are meant to ensure that the Flemish universities, university colleges and other statutory registered higher education institutions are in compliance with the relevant regulations imposed by law.

2 THE ASSESSED STUDY PROGRAMME

In accordance with its mission, the assessment panel visited Ghent University Global Campus (GUGC) from 5 till 6 November 2019:

- ENTE: Bachelor of Science in Environmental Technology;
- FOTE: Bachelor of Science in Food Technology;
- MBTE: Bachelor of Science in Molecular Biotechnology.

3. THE ASSESSMENT PANEL

3.1 Composition of the assessment panel

The composition of the assessment panel was ratified on 26 November 2018, 11 January en 11 June 2019 by the VLUHR Quality Assurance Board. The NVAO sanctioned the panel composition on 13 May 2019. The assessment panel was subsequently installed by the Quality Assurance Board by its decision of 17 July 2019.

The assessment panel had the following composition:

- Chairman of the assessment panel:
 - **Prof. Tiny van Boekel**, Emeritus Professor Food Science, Wageningen University, the Netherlands
- Panel members:
 - **Prof. Eva Top**, Professor of Biological Sciences, University of Idaho, USA
 - **Prof. Patrick Van Dijck**, professor Moleculaire Biotechnologie van Planten en Micro-organismen, KU Leuven, Belgium
 - **Dr. Lee Min Seob**, CEO of Eone diagnostics Genome Center, South Korea
 - **Charlotte Adams**, student Master in Biochemistry and Biotechnology, University of Antwerp, Belgium

Patrick Van den Bosch, Policy Advisor of the Quality Assurance Unit of the Flemish Higher Education Council, was project manager of this educational assessment and acted as secretary to the assessment panel.

The brief curricula vitae of the members of the assessment panel are listed in Appendix 1.

3.2 Task description

The assessment panel is expected:

- to express substantiated and well-founded opinions on the study programme, using the assessment framework;
- to make recommendations allowing quality improvements to be made where possible;
- to inform society at large of its findings.

3.3 Process

3.3.1 Preparation

The study programmes were asked to compile an extensive self-evaluation report in preparation for the educational assessment. An assessment protocol, with a detailed description of the expectations regarding the content of the self-evaluation report, was presented by the Quality Assurance Unit of VLUHR for this purpose. The self-evaluation report reflects the accreditation framework.

The assessment panel received the self-evaluation report a number of months before the site visit, which allowed for adequate time to carefully study the document and to thoroughly prepare for the visit. Additionally, the panel members were asked to read all Bachelor's theses.

The assessment panel held its preparatory meeting on 27 September 2019. At this stage, the panel members were already in possession of the assessment protocol and the self-evaluation report. During the preparatory meeting, the panel members were given further information about the assessment process and they made specific preparations for the forthcoming site visit. Special attention was given to the uniformity of the implementation of the accreditation framework and the assessment protocol. Also, the time schedule for the assessment visit was agreed upon (see Appendix 2) and the self-evaluation report was collectively discussed for the first time.

3.3.2 Site visit

During the site visit the panel interviewed all parties directly involved with the study programmes. The panel spoke with university management, programme management, students, teaching staff, educational support staff, alumni, and representatives from the professional field. The conversations and interviews with all these stakeholders took place in an open atmosphere and provided the panel with helpful additions to and clarifications of the self-evaluation report.

The panel visited the programme-specific infrastructure facilities, including the library, classrooms, computer facilities and laboratories. There was also a consultation hour during which the assessment panel could invite people or during which people could come and be heard in confidence.

Furthermore, the institution was asked to prepare a wide variety of documents to be available during the site visit for the assessment panel to consult as a tertiary source of information. These documents included minutes of discussions in relevant governing bodies, a selection of study materials (courses, handbooks and syllabuses), indications of staff competences, testing and assessment assignments, etc. Before the site visit, the panel read all bachelor' theses. Sufficient time was scheduled throughout the assessment visit for the panel to study these documents thoroughly.

Following internal panel discussions, provisional findings were presented by the chairman of the assessment panel in conclusion of the site visit.

3.3.3 Reporting

The last stage of the assessment process was the compilation of the panel's findings, conclusions, and recommendations into the present report. The panel's recommendations are separately summarised at the end of the report.

The study programmes were given the opportunity to reply to the draft version of this report. The panel considered this response and included elements of it into the final version when deemed appropriate.

PART II

Table with scores

The following table represents the assessment scores of the assessment panel on the three generic quality standards set out in the assessment framework.

For each generic quality standard (GQS) the panel expresses a considered and substantiated opinion, according to a two-point scale: satisfactory or unsatisfactory. The panel also expresses a final opinion on the quality of the programme as a whole, also according to a two-point scale: satisfactory or unsatisfactory.

In the report the assessment panel makes clear how it has reached its opinion. The table and the scores assigned ought to be read and interpreted in connection to the text in the report. Any interpretation based solely on the scores in the table, is unjust towards the study programme and passes over the assignment of this external assessment exercise.

Explanation of the scores of the **generic quality standard**:

Satisfactory (S) The study programme meets the generic quality standard

Unsatisfactory (U) The generic quality standard is unsatisfactory

Rules applicable to the final **opinion**:

Satisfactory (S) The final opinion on a programme is 'satisfactory' if the programme meets all generic quality standards.

Unsatisfactory (U) The final opinion on a programme is 'unsatisfactory' if all generic quality standards are assessed as 'unsatisfactory'.

Satisfactory for a limited period (S') The final opinion on a programme is 'satisfactory for a limited period', i.e. shorter than the accreditation period, if, on a first assessment, one or two generic quality standards are assessed as 'unsatisfactory'.

	GQS 1 Targeted outcome level	GQS 2 Educational learning environment	GQS 3 Outcome level achieved	FINAL OPINION
Bachelor of Science in Environmental Technology	S	S	S	S
Bachelor of Science in Food Technology	S	S	S	S
Bachelor of Science in Molecular Biotechnology	S	S	S	S

SECTION 2

Report of the study
programmes

GHENT UNIVERSITY GLOBAL CAMPUS

Bachelor of Science in Environmental Technology
Bachelor of Science in Food Technology
Bachelor of Science in Molecular Biotechnology

SUMMARY

Ghent University Global Campus

From 5 till 6 November 2019, three bachelor programmes of the Ghent University on the Ghent University Global Campus (GUGC): Bachelor of Science in Environmental Technology; Bachelor of Science in Food Technology and Bachelor of Science in Molecular Biotechnology have 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

Ghent University Global Campus (GUGC) operates in Songdo, South Korea, within the Incheon Global Campus (IGC). The IGC is a national project established by the Korean government and Incheon Metropolitan City, with the overall aim of hosting 10 universities and/or research institutions (10,000 students in total) by 2025. The goal of IGC is to nurture future global leaders and to innovate and globalise the education system in South Korea.

The Bachelor in Environmental Technology (ENTE) focuses on land, water and air and current (engineering) technologies to assess, monitor and help solve environmental risks by anthropogenic activities (including ecological risks) in these environments. Graduates could, for example, examine sustainable ways to remediate air pollution. The Bachelor in Food

Technology (FOTE) covers chemical, physicochemical, microbiological, nutritional and technological aspects of foods, focusing on raw materials and processing thereof, production processes, preservation and preparation. Graduates could for instance be involved in quality control of food in production processes. The Bachelor in Molecular Biotechnology (MBTE) aims at combining competencies and skills with regard to living organisms, biotechnology and engineering. As such graduates will be able to understand the biochemical, genetic and molecular processes in various living organisms and use them for (engineering) applications with a main focus on applications in white, green and red biotechnology. MBTE graduates will for instance be able to genetically engineer plants.

The intended programme specific learning outcomes are at the bachelor's level and consequently fit the Flemish qualification framework. The programme brings a unique contribution to Korean higher education.

Programme

Although the three programmes lead to a different diploma, they have an extensive common curriculum. The courses in the first and second bachelor are completely the same for all three programmes (120 ECTS). In the third and fourth bachelor year there are still 64 ECTS of common courses. In each of the three programmes, there are 56 ECTS of programme-specific courses in total. In bachelor 4, students spend their first semester in Ghent. Most students in the programmes are Korean students.

The academic year starts in the first week of September and students have 12 weeks of classes (in the first two years) followed by one week of catch-up activities, three weeks of exams and one week for feedback. In the last two years, the students are also taught by nonresident staff. This is called the 'flying faculty'. The staff comes from the Ghent campus in Belgium and stays only for a short period in South-Korea. Because of this, the second semester for Bachelor 3 and Bachelor 4 consists of three times four weeks of classes each time followed by one week of exams.

Overall the curriculum addresses all learning outcomes. The content of the curriculum is well-balanced and strong, but an additional course specifically targeting food science and one on environmental science in the first two bachelor years (possibly elective courses) would make that more students choose these programmes from bachelor 3 onwards. There is a significant imbalance in the amount of students choosing for MBTE

while only a few choose ENTE or FOTE. The programme management is well aware of this imbalance and is implementing measures to reduce it.

The programmes are coherent. In case of an overlap, this is discussed between students and teaching staff. The teaching methods are varied and adapted to the needs of the students. Every course uses a combination of different teaching and learning methods. The variation of methods used is also visible in the high level of attention that is paid to both wet and dry lab experience. Students perceive the study load of the programmes as satisfactory, but heavy.

Evaluation and testing

GUGC has a clear assessment policy for its programmes that focuses on validity, transparency, reliability and feedback and feedforward. Up to 12 different evaluation methods are used throughout the programmes, with multiple evaluation methods being used within a single course. Most courses have both an end-of-term evaluation and a continuous assessment. During evaluation, skills and application of knowledge are assessed, through a range and combination of relevant evaluation methods. This is in line with the assessment policy.

Students are very positive about the feedback they receive from most of the teaching staff. Teaching staff is open to give feedback. Students complain that the flying faculty are not easily accessible for feedback. The programme management of the three programmes intends to accommodate feedback moments for flying faculty by videoconferencing.

The quality of the bachelor thesis of the three programmes is rather high. Some of them were close to the quality expected for a master thesis. Currently there is a focus on data collection in the theses. In order to strengthen the learning outcome on the student's critical mindset, the focus should be more on the writing skills and the processing and interpretation of the data instead of the results and the data collection.

Services and student guidance

The admission requirements are described in GUGC's Education and Examination Code. An admission guide is updated annually and guides prospective students through the detailed steps of admission. Together with the online admission form, students need to submit their high school degrees (high school transcript(s), proof of English proficiency and

their score on the online aptitude test. The online application will then be checked by the admissions officer and students will be notified, at the latest within four weeks of submission.

GUGC has invested significantly in improving the study guidance and study trajectory guidance. The study counselling unit from the academic affairs team consists currently of three people that take care of study guidance. The main tasks are providing personalised counselling to students, academic advising, tutoring and organising information sessions. Students can contact student counsellors, psychologists and the ombudsperson for several specific services. For tutoring they now have a peer tutoring programme in which senior students tutor younger students. There are two ombudspersons that take care of student issues. Recently the programmes provide counselling by a psychological counsellor: this person is shared with the other universities on campus.

Study success and professional opportunities

Initially, the passing rates were very low. This was due to the students underestimating the level of mathematics and chemistry required to succeed in the first bachelor year.

The outcome level is clearly achieved by the quality of the students that graduate, which is e.g. clear from the fact that most of them have enrolled in masters in different places. The programmes have two aims: preparing students for furthering their studies, as well as preparing students for entering the labour market. A lot of students start their study with the plan of working after acquiring the bachelor, but during their study they are encouraged to acquire a graduate degree. If the programmes' goal remains to be to make students ready for the professional field, teaching staff should also encourage this path more.

ASSESSMENT REPORT

Ghent University Global Campus

Preface

This report concerns the review of three bachelor programmes of the Ghent University on the Ghent University Global Campus (GUGC): Bachelor of Science in Environmental Technology; Bachelor of Science in Food Technology and Bachelor of Science in Molecular Biotechnology. The programmes are English-taught, four-year programmes of 240 ECTS. The site visit of the panel took place from 5 till 6 November 2019.

The panel assesses the study programmes based on the three standards of the VLUHR programme assessment framework. This framework is designed to fulfil the accreditation requirements, applied by the NVAO. For each standard the panel gives a weighted and motivated judgement on a two-point scale: unsatisfactory or satisfactory. In assessing the generic quality assurance, the concept of 'generic quality' means that the standard is in place and the programme meets the quality standards that can reasonably be expected, from an international perspective, of a Bachelor's programme in higher education. The score satisfactory points out that a programme meets the generic quality because it demonstrates an acceptable level for the particular standard. The score unsatisfactory indicates that a programme does not attain the generic quality for that particular standard.

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 programmes as a whole, also according to the same two-point scale.

The panel assesses the quality of the programmes 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, the university management, teaching staff, students, representatives of the professional field, alumni and personnel responsible at programme level for internal quality assurance, internationalisation, study guidance and student tutoring. The panel has examined the course materials, all bachelor theses of the three programmes, test and evaluation assignments and relevant reports available. The panel has also visited the educational facilities during the site visit at the GUGC.

In addition to the judgement, the panel also formulates recommendations with respect to quality improvement. In this manner, the panel wants to contribute to improving the quality of the programme. The recommendations are included in the relevant sections of the respective standard. At the end of the report there is an overview of improvement suggestions.

Context of the study programmes

Ghent University Global Campus (GUGC) operates in Songdo, South Korea, within the Incheon Global Campus (IGC). The IGC is a national project established by the Korean government and Incheon Metropolitan City, with the overall aim of hosting 10 universities and/or research institutions (10,000 students in total) by 2025. The goal of IGC is to nurture future global leaders and to innovate and globalise the education system in South Korea.

The GUGC has three programmes:

- ENTE: Bachelor of Science in Environmental Technology;
- FOTE: Bachelor of Science in Food Technology;
- MBTE: Bachelor of Science in Molecular Biotechnology.

Although the three programmes lead to a different diploma, they have an extensive common curriculum.

The courses in the first and second bachelor are completely the same for all three programmes (120 ECTS). In the third and fourth bachelor year there are still 64 ECTS of common courses. In each of the three programmes, there are 56 ECTS of programme-specific courses in total. In bachelor 4, students spend their first semester in Ghent. Most students in the programmes are Korean students.

In 2017-2018 60 students enrolled for the first time in bachelor 1. In the same year:

- 2 students enrolled in bachelor 3 and 1 in the bachelor 4 of the ENTE programme (model trajectory)
- 2 students enrolled in bachelor 3 and 0 in the bachelor 4 of the FOTE programme (model trajectory)
- 8 students enrolled in bachelor 3 and 2 in the bachelor 4 of the MBTE programme (model trajectory)

Since 2017-2018, three local committees support the programmes following the model that is used at Ghent University faculties: a Study Programme Committee (SPC), a Curriculum Committee and an Examination Board. Next to that there is a Campus Council and an Educational Quality Control Unit (EQCU). Besides the committees that are established at the campus in Korea, there is a committee that links GUGC with Ghent University in Belgium: the Intercampus Council (IC). In Ghent there are also Korea commissions in each collaborating faculty.

The academic year starts in the first week of September and students have 12 weeks of classes (in the first two years) followed by one week of catch-up activities, three weeks of exams and one week for feedback. In the last two years, the students are also taught by nonresident staff. This is called the 'flying faculty'. The staff comes from the Ghent campus in Belgium and stays only for a short period in South-Korea. Because of this, the second semester for Bachelor 3 and Bachelor 4 consists of three times four weeks of classes each time followed by one week of exams.

Standard 1 - Targeted Outcome Level

The panel evaluates the targeted outcome level as satisfactory.

The **Bachelor in Environmental Technology (ENTE)** focuses on land, water and air and current (engineering) technologies to assess, monitor and help solve environmental risks by anthropogenic activities (including ecological risks) in these environments. Graduates could, for example, examine sustainable ways to remediate air pollution.

The **Bachelor in Food Technology (FOTE)** covers chemical, physicochemical, microbiological, nutritional and technological aspects of foods, focusing on raw materials and processing thereof, production processes, preservation and preparation. Graduates could for instance be involved in quality control of food in production processes.

The **Bachelor in Molecular Biotechnology (MBTE)** aims at combining competencies and skills with regard to living organisms, biotechnology and engineering. As such graduates will be able to understand the biochemical, genetic and molecular processes in various living organisms and use them for (engineering) applications with a main focus on applications in white, green and red biotechnology. MBTE graduates will for instance be able to genetically engineer plants.

The three programmes have each a set of **programme specific learning outcomes**. These were thoroughly revised in 2018. Although the programmes aim for largely the same learning outcomes, there are some differences that reflect domain-specific competencies. They reflect all competencies that the programmes aim for students to acquire. The panel states they are in line with the Ghent University Competence Model, the domain-specific learning outcomes and the Flemish qualification framework. They are a more concrete and applicable translation of the domain-specific learning outcomes: the programmes' management opted to define some additional learning outcomes that are not covered by the domain-specific learning outcomes. Students witness that in the first session of the course, each teacher clearly indicates the learning outcomes of the course.

In order to seek a comparison of the programmes against the Korean higher education landscape, the GUGC has attempted to **benchmark** the learning outcomes of the three programmes to similar programmes offered at Korean Universities. The panel learned that this benchmark showed the unique aspects (in Korean context) of the approach in the three programmes such as the attention paid to communication (in English), collaboration and social competencies; the hands-on driven approach and a certain degree of multi-perspectivism and interdisciplinarity.

Representatives from the **professional field** were involved in the reflections on the learning outcomes. The representatives of the field currently involved are well acquainted with the courses. The panel recommends that in time the programmes should involve a broader and more diverse group from the professional field in order to foster an even broader perspective of the needs of the Korean professional field.

Representatives from the professional field mention in their meeting with the panel that the programmes have some **unique advantages** compared with programmes of other institutions in South-Korea. According to them, the main advantages of the programmes are the use of English as the course language; the inclusion of a semester in Ghent and the learning of problem-solving skills.

All in all, it is the panel's opinion that the intended programme specific learning outcomes are at the bachelor's level and consequently fit the Flemish qualification framework. The programme brings a unique contribution to Korean higher education.

Standard 2: Educational Learning Environment

The panel evaluates the Educational Learning Environment as satisfactory.

The three programmes have an **extensive common curriculum**. The courses in the first and second bachelor are completely the same for all three programmes (120 ECTS). In the third and fourth bachelor there are still 64 ECTS of common courses. In each of the three programmes, there are 56 ECTS of programme-specific courses in total. The panel learned that students choose their final programme only at the start of the third bachelor.

The students informed the panel that the difference between the three programmes is made clear to the students. The students state that they make their decision for the programme they want to enroll in in bachelor 3 on the courses they were interested in and performed well in during the first two years. Also, the teaser courses from each of the three programmes helped the students in making their decision.

The panel checked the ECTS files and had the opportunity to examine the course materials of the three programmes. Overall the curriculum addresses all **learning outcomes**. The discussions during the site visit made clear that the content of the curriculum is well-balanced and strong, but an additional course specifically targeting food science and one on environmental science in the first two bachelor years (possibly elective courses) would make that more students choose these programmes from bachelor 3 onwards.

After all, a concern of the panel is that there is a significant **imbalance** in the amount of students choosing for MBTE while only a few choose ENTE or FOTE. The programme management is well aware of this imbalance and is implementing measures to reduce it. For instance, the programme management is working on an integrative course on Biochemistry taught together by teachers from the three programmes. This is strongly recommended to allow students to make links between the content in different courses.

The panel has identified a number of **possible measures** to address this imbalance. The panel suggests to move 'Microbiology' from the first bachelor to the second bachelor and to start a more basic biochemistry

course (starting with the basics of the macromolecules) as the first course. The panel understood that this is indeed being looked at for the near future. Next to changing courses, promotion by inviting companies, giving guest lectures and showing career possibilities can potentially attract more students to ENTE and FOTE.

Care should be taken that students are sufficiently prepared for today's professional field by having enough skills in programming and biostatistics/data science. This does not necessarily have to be done in a separate class but by making sure that it is covered in exercises in various advanced classes.

The MBTE programme has an **'ethics'** course whereas the other two programmes do not. In today's society it is recommended to pay more attention to bioethics and professional ethics. Therefore, the panel recommends to initiate a course on ethics in all three programmes.

The panel states that the ENTE curriculum is a bit weak in advanced microbiology classes. Since many water, air, soil remediation technologies (like wastewater treatment) are microbe-based, a general microbiology course is not really sufficient. Therefore, the panel encourages the plans to include courses in climate change and in indoor air quality (instead of gas treatment) in the ENTE programme. The ENTE curriculum should also include an advanced microbiology class such as microbial ecology or microbial physiology. Currently the ENTE students have less practical courses compared to the other programmes, this should be remediated, which again may result in more students going to this programme.

The programmes are **coherent**. In case of an overlap, this is discussed between students and teaching staff. However, some courses like Environmental Soil Science and Soil Remediation overlap too much. This has to be solved. There was also an overlap between Process Engineering and Food Technology, but this was solved with the Study Programme Committee.

To ensure that students have the opportunity in Bachelor 1 and 2 to explore courses that are in line with the programmes they can follow from Bachelor 3 onwards, **elective courses** can further stimulate these interests of students. The panel advises that each of the 3 programmes be given an equal share in the choice of elective courses. This could lead to students making a different choice of programme from Bachelor 3 onwards. The panel thinks that one such course could be given by invited professionals

of companies active in one of the three programmes. This could be a course in the second semester of the second year as this may influence the choice of the students. Such invited speakers must be fluent in English. Other courses suggested by alumni were physiology of human diseases or computer science.

To realise the implementation of elective courses in the last two years of the programmes, the programmes' management is already thinking about reducing the number of credits for the bachelor thesis and another compulsory course. The panel supports that these two open slots would create openness to new possibilities such as an internship, choosing an elective course from one of the two other programmes or even choosing an elective course from other universities.

The **teaching methods** are varied and adapted to the needs of the students. Every course uses a combination of different teaching and learning methods. The variation of methods used is also visible in the high level of attention that is paid to both wet and dry lab experience.

The **group discussions** are already an important aspect of the curriculum, and there is interest from both students and teaching staff to further expand this element. This is extremely important given the challenges for Korean students to express themselves in English and learn to openly discuss and argue about a topic.

The teaching staff coming from Belgium indicates that for each of them this required a major change in their approach to teaching methods for Korean students. The teaching staff explained to the panel that students of the three programmes at GUGC are more **interactive** than in the Ghent campus in Belgium. The kinds of questions they ask are also different. Another aspect that became clear to the panel from the meeting with the programme management and staff is that Korean students consider themselves as **customers**. From their perspective, they pay a lot and in return they want to be taught by the teacher. This makes specific methods of teaching, such as flipped classroom a challenge, as the students seem to get the idea that they have to work instead of receiving the information they paid for.

Although the teaching staff is aware of the differences between Flemish and Korean culture and traditions, the panel recommends that teachers who are new to the GUGC receive more structural guidance in the use of

appropriate learning and working methods. For example, some teachers adjust their course materials where they change Western European examples to Korean examples. This is much appreciated by the students.

Since several teachers only spend a limited amount of time at the GUGC - the so-called flying faculty - their courses use the **'block teaching' method**. The panel learned from the students that block teaching is less popular amongst them. Additionally, they complain that receiving feedback is not as evident as for the other courses. Also, contact with teaching staff after they returned to their home campus in Ghent is not optimal (see supra). The panel recommends the amount of block teaching should not be increased. Due to the block teaching, students receive a lot of information in a short period of time. To ensure that students achieve the learning outcome targets it must be prevented that the students learn the courses by heart for a short period. Therefore, the panel finds the mock exams a good initiative to help the student in what they can expect on their exams (see standard 3).

In bachelor 4, the students go on an **exchange semester** to the campus in Ghent. The panel finds this a very positive aspect of the curriculum that should definitely be maintained. It greatly contributes to the cultural exchange which is a unique strength of the programmes. The panel encourages to continue providing the necessary information and logistic support so that students are comfortable and can adapt quickly to a very different culture and place of living. That way they can completely focus on their classes in Ghent. While in Ghent, a number of courses are master courses. The programme management should strive for courses on the bachelor level as much as possible, but given the special conditions of these three programmes, the management could argue for occasional exceptions.

The students in the global campus have the same rights and obligations as those in Ghent. The panel finds the open communication between the two groups essential. The contact of the **student representatives** with those in Ghent, usually happens with the Ba4 students coming to home campus. Additional efforts should be made to let this contact happen sooner. Therefore the panel suggests to let also student representatives from the bachelor 1, 2 and 3 participate in these contacts with home campus representatives, and to organise a meeting (once or twice a year) where the students can discuss the current issues and share notes on how they handle them at the different campuses.

Students perceive the **study load** of the programmes as satisfactory, but heavy. In 2018-2019, the programmes' management has started to analyse which course units are perceived as heavy. They ensured the panel this will be taken into account when designing and implementing the programme changes that are planned for 2020-2021.

The **admission requirements** are described in GUGC's Education and Examination Code. An admission guide is updated annually and guides prospective students through the detailed steps of admission. Together with the online admission form, students need to submit their high school degrees (high school transcript(s), proof of English proficiency and their score on the online aptitude test. The online application will then be checked by the admissions officer and students will be notified, at the latest within four weeks of submission. The students indicate in their meeting with the panel that in their choice of programme, the reputation of the programmes and the university is of great importance to them and to their parents.

The **permanent teaching staff** currently amounts to 14 teachers and lecturers and nearly 30 assistant academic teachers. The greater majority of the academic staff are Ghent University professors who are affiliated with either the Faculty of Bioscience Engineering or the Faculty of Sciences. In general, the (co-) lecturers are directly involved in research activities related to the specialised courses they teach, ensuring that students are acquainted with the latest developments in the research domain.

The permanent teaching staff features a good mix between more experienced teachers and younger teachers, taking care of all courses in the first two bachelor years and some of the specialised courses in bachelor 3 and 4. Most of the permanent teaching staff are male. The programme management should keep in mind the gender spread of the staff. The flying faculty are mostly renowned Ghent University teaching staff who come to teach certain courses on site at GUGC during the second semester of bachelor 3 and bachelor 4 in modules of four weeks. There are also assistant academic staff members from Ghent University that provide additional help with the teaching activities during these modules.

The panel is very impressed with the quality and passion of the staff for their teaching assignments. They keep the learning goals and students' background in mind and adjust their courses as needed. The students are very pleased with the quality of the teaching assistants.

The **number of local staff is rather low**, certainly if the number of students will continue to increase. The panel learned that the number of teaching assistants on campus will continue to increase if the student numbers will continue to increase.

GUGC has a 10-floor **education and research building**. The first six floors are dedicated to teaching, while the 7th to 10th floors have been designed for research. GUGC has its own auditorium in which 225 students can be seated. GUGC also uses external lecture halls from the other universities on site. Next to that classrooms and laptop classrooms are present. There are currently four equipped teaching laboratories. The ICT infrastructure is first-class and allows for smooth communication through videoconferencing with Ghent University stakeholders. The panel was impressed by the highly qualitative facilities the GUGC has for its students. The facilities in the labs are also excellent, as also the IT in the classrooms is. The students have 24/7 access to the campus. They have facilities to work on group projects and to have an alternative place to study. The facilities for students in ENTE are more limited and were developed more slowly in time than for MBTE and FOTE. This may be part of the reason why students are less attracted to this major. It was not clear to the panel why not every floor has the same research facilities which should equally attract students in the three programmes.

Not all Korean students are fluent in **English**: the GUGC therefore implements several English language courses in which the students not only get acquainted with English, they also learn to work in groups and they choose topics on which they make a presentation. The students realise they have a great advantage in being much more fluent in English and having been exposed to group work, discussions and a thesis project that challenge them to communicate in English. Many students informed the panel that their reason for applying to GUGC was because they appreciated the European culture and education delivered in English in their home country.

The panel commends that GUGC has invested significantly in improving the **study guidance and study trajectory guidance**. The study counselling unit from the academic affairs team consists currently of three people that take care of study guidance. The main tasks are providing personalised counselling to students, academic advising, tutoring and organising information sessions. Students can contact student counsellors, psychologists and the ombudsperson for several specific services.

For tutoring they now have a peer tutoring programme in which senior students tutor younger students. There are two ombudspersons that take care of student issues. Recently the programmes provide counselling by a psychological counsellor: this person is shared with the other universities on campus.

The panel concludes that the educational learning environment complies with the required generic quality. The curriculum is aimed at the learning outcomes. The programmes' structure is solid and good learning methods are in place. The programmes are highly international. There is an imbalance in the student numbers choosing for the different programmes, which might be remediated by adjusting some courses in the first two bachelor years. The number of resident staff members can be increased. The programme is supported by sufficient and adequate facilities and student guidance services.

Standard 3 - Outcome Level Achieved

The panel evaluates the outcome level achieved as satisfactory.

GUGC has a clear **assessment policy** for its programmes that focuses on validity, transparency, reliability and feedback and feedforward. The panel looked at an extensive sample of exams. To a large extent, every competence (that can be found in the ECTS file) is reflected in one of the questions. The students are aware of the competences they have to achieve in every course. GUGC has also linked several actions to its policy, such as increasing the number of oral exams, strengthening the feedback culture and monitoring the workload of mid-term exams. Students are satisfied with the validity and transparency of the exams. The panel commends that the programme management of the three programmes is well aware of its current strengths and weaknesses.

Up to 12 different **evaluation methods** are used throughout the programmes, with multiple evaluation methods being used within a single course. Most courses have both an end-of-term evaluation and a continuous assessment. During evaluation, skills and application of knowledge are assessed, through a range and combination of relevant evaluation methods. This is in line with the assessment policy. The panel noted that there are only minor differences in the use of evaluation methods between the three programmes.

GUGC emphasises the importance of **feedforward**, meaning preparing students for assessments and setting their expectations. Feedforward strategies are to give examples of previous exams throughout the lectures and help students on their way to formulate good answers, such as by organising one or more practice exams or mock exams during the semester. The panel learned that it is deemed important to illustrate model answers (rather than model questions). Regarding continuous assessment, students need to be further incentivised to prepare for practical courses, by giving them assignments and protocols before the practical courses start and to be handed in by that session, or by having them take a short (online) test.

Students in bachelor 1, 2 and 3 do not have **oral exams** and come into contact with oral examination for the first time during the Ghent semester. They expressed to the panel that they want oral exams earlier in the programme, with the intention to be prepared for this examination form. They did however add that some guidance would be needed because they have no experience with this evaluation form.

Students are very positive about the **feedback** they receive from most of the teaching staff. Teaching staff is open to give feedback. In general students are able to contact teaching staff for feedback within office hours. Students particularly enjoyed immediate face to face feedback and the feedback in video form. In MBTE face to face feedback seems standard practice. In FOTE and ENTE feedback is often given during lecture time. Students complain that the flying faculty are not easily accessible for feedback. The programme management of the three programmes intends to accommodate feedback moments for flying faculty by videoconferencing.

Before the site visit, the panel read all **bachelor's theses**. In the Bachelor's project knowledge and skills regarding scientific competencies, competencies in the disciplines, intellectual competencies, and competencies in collaboration and communication are integrated. In the Bachelor's dissertation, the student needs to prepare a state-of-the-art summary of relevant scientific literature on a particular topic. In this report, a firm scientific question is recognised and formulated, and an experimental approach is designed. Next to that, the scientific outcome of the experiments needs to be summarised in a rational and systematic way, leading to clear conclusions.

There is a clear **evaluation form** for the bachelor thesis. The thesis is evaluated through a Bachelor's dissertation and open (public) defense.

After the thesis defense, students receive oral feedback. The panel recommends providing written feedback for every student. This would increase the transparency of the assessment process. Such feedback about the content and writing may help the students a lot in their future research and writing projects. As determined in the GUGC's Education and Examination Code the scores have to be transparent and traceable.

The panel found the quality of the bachelor thesis of the three programmes rather high. Some of them were close to the quality expected for a master thesis. Currently there is a focus on data collection in the theses. In order to strengthen the learning outcome on the student's critical mindset, the focus should be more on the writing skills and the processing and interpretation of the data instead of the results and the data collection. In addition, the representatives from the professional field informed the panel that the most important skills they look for are collaboration and communication, project design and risk assessment. The panel suggests incorporating these more in the bachelor thesis.

Students are informed about **plagiarism**, but the panel learned that bachelor thesis is not yet checked for plagiarism. The panel finds it important that students clearly understand what plagiarism is and a lecture on science integrity and plagiarism must be provided.

Initially, the **passing rates** were very low. The panel concludes after discussions about this topic with all stakeholders that this was due to the students underestimating the level of mathematics and chemistry required to succeed in the first bachelor year.

The panel finds the **outcome level** is clearly achieved by the quality of the students that graduate, which is e.g. clear from the fact that most of them have enrolled in masters in different places. The panel learned that a lot of students see this degree as a good steppingstone for further higher education. Alumni told the panel they wanted to learn more and wanted to go further in an academic career.

The programmes have two aims: preparing students for furthering their studies, as well as preparing students for entering the labour market. A lot of students start their study with the plan of working after acquiring the bachelor, but during their study they are encouraged to acquire a graduate degree: they witnessed to the panel that they wanted to be more engaged in research and would therefore choose a master's degree.

If the programmes' goal remains to be to make students ready for the professional field, teaching staff should also encourage this path more. The panel recommends further communication with the companies (in biotech, in environmental technology and in food technology) so that these companies are aware of the quality of the students that graduate in the three programmes. The panel suggests the programmes to be involved in a career day with the other universities on campus.

The panel concludes that the programmes have a valid, reliable, and transparent method of testing and assessing. Students are prepared for further studies and to enter the labour market. Nevertheless, until now most students continue to a master's programme.

Final judgement of the assessment panel

As **Standard 1** is evaluated as satisfactory, **Standard 2** is evaluated as satisfactory and **Standard 3** is evaluated as satisfactory the final judgement of the assessment panel about the **Bachelor of Science in Environmental Technology** is satisfactory such according to the decision rules.

As **Standard 1** is evaluated as satisfactory, **Standard 2** is evaluated as satisfactory and **Standard 3** is evaluated as satisfactory the final judgement of the assessment panel about the **Bachelor of Science in Food Technology** is satisfactory such according to the decision rules.

As **Standard 1** is evaluated as satisfactory, **Standard 2** is evaluated as satisfactory and **Standard 3** is evaluated as satisfactory the final judgement of the assessment panel about the **Bachelor of Science in Molecular Biotechnology** is satisfactory such according to the decision rules.

Summary of the recommendations for further improvement of the study programmes

Standard 1 – Targeted Outcome Level

- Involve a broader and more diverse group from the professional field in order to foster an even broader perspective of the needs of the Korean professional field.

Standard 2 – Educational Learning Environment

- Implement an additional course specifically targeting food science and one on environmental science in the first two bachelor years (possibly elective courses);
- Move 'Microbiology' from the first bachelor to the second bachelor and introduce a more basic biochemistry related course;
- Take care that students are sufficiently prepared for today's professional field by having enough skills in programming and biostatistics/data science;
- Initiate a course on ethics;
- Include courses in climate change and in indoor air quality in the ENTE programme;
- Include an advanced microbiology class such as microbial ecology or microbial physiology in the ENTE programme;
- Introduce more practice oriented working methods in the ENTE programme;
- Continue to monitor the overlap in courses;
- Provide the 3 programmes an equal share of elective courses;
- Give more structural guidance to teachers who are new to the GUGC in the use of appropriate learning and working methods;
- Do not increase the courses that use 'block teaching';
- Let student representatives from Ghent and GUGC get in touch with each other early in the programme.

Standard 3 – Outcome Level Achieved

- Give students guidance in dealing with oral exams;
- Make sure that teaching staff from the flying faculty also invest in providing feedback to students;
- Provide written feedback on the bachelor's thesis to every student;
- Focus in the bachelor's thesis should be more on the writing skills and the processing of the data instead of the results and the data collection;
- Inform students about plagiarism and provide a lecture on science integrity;

- Connect to the companies (in biotech, in environmental technology and in food technology) so that these companies are aware of the quality of the students that graduate in the three programmes.

APPENDICES

APPENDIX I

Curricula vitae of the members of the assessment panel

Tiny van Boekel is emeritus professor in Food Science at Wageningen University. He obtained his BSc (1975), MSc (1977) and PhD (1980) in Food Science & Technology from Wageningen University, the Netherlands. He worked for 2 years at the Food Inspection Service in Rotterdam from 1980-1982 and then returned to Wageningen University to work as Assistant Professor (1982-1994), Associate Professor (1994-2001) and Full Professor (2001-2012) in Food Science & Technology. His research and teaching was about modelling of food quality in general and proteins in particular. He published some 240 scientific papers and is author/co-author of 6 books. He was director of the PhD graduate school VLAG (Food Science, Nutrition, Agrotechnology and Health) from 2005-2010. In 2012 he became Dean of Education at Wageningen University and responsible for all the BSc and MSc programmes at Wageningen University. After his retirement as Dean in 2017, he was active as an interim special professor in Dairy Science & Technology. He became emeritus professor Food Science in April 2019 but is still active in the field and connected to Wageningen University.

Eva Top is a Professor at the University of Idaho in the Department of Biological Sciences, the Institute for Bioinformatics and Evolutionary Studies (IBEST), and the Bioinformatics and Computational Biology (BCB) graduate program. She is also affiliate faculty in the Department of Microbiology at the University of Washington. She received her Masters and Ph.D. degrees from the Ghent University in Belgium in biological engineering and microbial ecology. She is a fellow of the American Academy of Microbiology (AAM) and Secretary for the International Society

for Plasmid Biology and other Mobile Genetic Elements. Her research is currently focused on the ecology and evolution of multi-drug resistance (MDR) plasmids in bacteria. Since rapid spread of MDR to human pathogens threatens the treatment of infectious diseases, novel therapies are needed that limit the spread of new resistance genes. However, the factors that determine successful transfer and persistence of MDR plasmids are still poorly understood. Her main research questions focus on the evolutionary mechanisms and dynamics of plasmid-bacteria co-evolution. She is also interested in the natural reservoirs, diversity and evolutionary history of MDR plasmids in environmental habitats such as manure, biosolids and soil, and how these plasmids spread to human pathogens. Dr. Top has published 116 peer-reviewed manuscripts.

Patrick Van Dijck obtained his PhD degree in 1991 on mechanisms of transcriptional activation of androgen and estrogen regulated genes. A first postdoc was performed in the Laboratory of Molecular Cell Biology at the KU Leuven on trehalose metabolism and yeast stress resistance mechanisms. After a second postdoc at Janssen Pharmaceutica (J&J) between 1995 and 1997, he returned to the KU Leuven to become a group leader on a VIB-sponsored project. The VIB is the Flemish Institute for Biotechnology and comprises 8 centers. Since 2002 he is group leader of the VIB Center for Microbiology and since 2003 professor at the KU Leuven. Between 2012 and 2017 he was a member of the board of the Faculty of Science and a member of the KU Leuven council for Internationalisation. Since 2014 he is the head of the section on Molecular Biotechnology of Plants and Microorganisms of the Department of Biology. In 2019 he became part time CSO of the company StixFresh with the aim to bring a solution to the huge waste of fresh produce. In his research group, he is investigating the role of plant trehalose metabolism and its possible applications in drought stress tolerance. However, most people in the lab work on nutrient-induced signal transduction pathways that affect morphogenesis and virulence in the human fungal pathogens *Candida albicans* and *Candida glabrata*. Patrick Van Dijck published 190 refereed manuscripts and holds 17 patent applications. He currently leads a group of 23 researchers.

Min Seob Lee is a chairman of Diagnostics Inc, in California, and CEO of Eone Diagnostics Genome Center (KOSDAQ; EDGC) in South Korea. He is a visiting professor of Institute of Convergence Science & Technology in Incheon National University. He specializes research in precision medicine and scientific discoveries from genomics and health data. Dr. Lee is a writer

of book “Homo Hundred Genome Revolution” and published numerous scientific articles. He conducted his post-doctoral fellowship at Harvard Medical School and received a Ph.D. degree in Biological Science from City of Hope National Medical Center of the Beckman Research Institute in Duarte, California. He holds a Master of Biology from California State University, Los Angeles. He graduated Bachelor of Science in Biology from Kyung Hee University in Seoul Korea. He also completed executive MBA program of CEO in Bio-Technology from Seoul National University.

Charlotte Adams is a master student in Biochemistry & Biotechnology at the University of Antwerp. During her study programme she has gained a lot experience by actively participating in research through voluntary internships. She has been a student representative in the education committee for several years and in 2017 she participated in the self-reflection with peer review of her study programme.

APPENDIX II

Time schedule of the site visit

November 5, 2019

9:00–11:15	internal consultation
11:15–12:00	university management
12:00–13:00	lunch
13:00–14:00	programme management
14:00–14:30	internal consultation
14:30–15:45	campus tour
15:45–17:15	students
17:15–17:30	internal consultation
17:30–18:15	professional field
18:15–19:00	graduats
19:00	diner panel

November 6, 2019

9:00–9:30	internal consultation
9:30–11:00	teaching staff
11:00–11:15	internal consultation
11:15–12:00	suporting staff
12:00–13:00	lunch
13:00–14:00	consultation hour
14:00–15:00	internal consultation
15:00–15:30	programme management
15:30–17:30	final consideration
17:30	oral report
