ESTONIAN QUALITY AGENCY
FOR HIGHER AND VOCATIONAL EDUCATION

EKKA

Assessment Report

Life Sciences
Environmental Protection

Estonian University of Life Sciences

University of Tartu

2016

Contents

Introduction

The aim of the assessment panel was the evaluation of the Life Sciences and Environmental Protection study programme groups in two institutions: Estonian University of Life Sciences and University of Tartu.

The following persons formed the assessment panel:

Prof. Laurent Counillon (Chair)	University of Nice-Sophia Antipolis, France
Prof. Dietwald Gruehn	TU Dortmund University, Germany
Prof. Kari Keinänen	University of Helsinki, Finland
Prof. Rik Leemans	Wageningen University, The Netherlands
Prof. Ana Pelacho	University of Lleida, Spain
Prof. Olav Aarna (Employers representative)	Member of the Management Board, Estonian Qualifications Authority
Adrian Stan (Student representative)	Vice president at Timisoara Dentals Students Association, ESU, Romania

On October 2 2015, each external panel member was assigned Self Evaluation Reports (SERs) to analyse, either as "Expert 1", in charge of writing the final report on the programme, or as "Expert 2", whose task was to carefully analyse the SERs but not to write the report. In total all reports were red by two experts, plus the chair of the committee. In the weeks before the visit, all experts communicated their comments and questions on the SERs to EKKA and to the other experts. This preparation phase enabled the whole panel to be informed on initial strengths, area of improvement and important questions to ask during the visits.

After the preparation phase, the work of the assessment panel in Estonia started on 30th November 2015 with an introduction to the Higher Education System as well as the assessment procedure by EKKA, the Estonian Quality Agency for Higher and Vocational Education. The members of the panel agreed the overall questions and areas to discuss with each group at the two universities, which were part of the assessment process. The distribution of tasks between the members of the assessment panel was then organised and the schedule of the site visits was discussed.

Tasks of the Assessment panel

The overall task of the assessment panel was the evaluation of selected study programmes within the programme groups 'life sciences' and 'environmental protection', first at Estonian University of Life Sciences (EMU) and then at Tartu University (TU).

The study programmes under evaluation are:

Study Programme Group	**Study program**	**HEI**	**Level**
Life Sciences	Applied biology and aquatic and terrestrial ecosystems	Estonian University of Life Sciences	Bachelor
	Applied biology and aquatic and terrestrial ecosystems	Estonian University of Life Sciences	Master
	Biology	University of Tartu	Bachelor
	Gene Technology	University of Tartu	Bachelor
	Ecology and Biodiversity Conservation	University of Tartu	Bachelor
	Biology	University of Tartu	Master
	Biomedicine	University of Tartu	Master
	Gene Technology	University of Tartu	Master
	Ecology and Biodiversity Conservation	University of Tartu	Master
Environmental protection	Environmental Protection	Estonian University of Life Sciences	Bachelor
	Environmental Planning and Landscape Design	Estonian University of Life Sciences	Bachelor
	Nature Tourism	Estonian University of Life Sciences	Bachelor
	Natural Resources Management	Estonian University of Life Sciences	Bachelor
	Management of Urban and Industrial Landscapes	Estonian University of Life Sciences	Master
	Nature Tourism	Estonian University of Life Sciences	Master
	Natural Resources Management	Estonian University of Life Sciences	Master
	Landscape Protection and Preservation	Estonian University of Life Sciences	Master
	Environmental Technology	University of Tartu	Bachelor
	Environmental Technology	University of Tartu	Master

Before the site visits, all members of the panel exchanged their first impressions about the written material provided and sent feedback in a format provided by EKKA in order for the preparation phase to be informed by some initial areas identified as strengths and possible areas of improvement. The most important documents used for the preparation of the evaluation were the self-evaluation reports from both universities. In both cases the panel received full details of the programmes being evaluated and these reports formed the basis of the early

work of the panel.
Based on a detailed look at each curriculum, the assessment panel discussed and identified possible areas for curriculum adaptation and development in the light of identified changing needs and expectations of Estonian society as well as within the broader international community.

General findings and recommendations

ESTONIAN UNIVERSITY OF LIFE SCIENCES

Programmes

The Estonian University of Life Sciences offers 10 programmes, at BSc and MSc levels. Eight of them belong to the Environmental protection group and 2 to the Life Sciences group. Taken together, the study programmes are of good quality and their different parts form a coherent whole. Their goals are to provide the students with applied knowledge for professional life. From a broad perspective, the contents and organization of the curricula ensure that the programmes are consistent with the learning outcomes. However, content evolution and some internal reorganization can help to further improve the different programmes.

Efforts have been deployed to take into account the feedback from students, alumni and employers. Although there was not enough detail given on the job market and potential employers in the SERs, the discussions with alumni led to the conclusion that the programmes fit quite well with the positions offered by the employers.

With respect to National and International Standards, the number of programmes (10) is rather high for the student number and for the size of the Institution. The reasons for this situation were explained to the panel. They appeared to be due to historical, structural and practical causes. However, the committee opinion is that this situation could not be sustainable in the long term. The committee strongly advises both (i) to rethink the programmes denominations, so that they would better fit the contents (see the specific comments on environmental planning for example) and/or (ii) to find an approach to combine them efficiently. The most obvious possibility would be perform clever merging at the BSc levels while leaving elective courses that would allow progressive specialization. The committee also recommends that enough time and reflexion have to be dedicated to this essential process, as brute forcing it might be counterproductive.

Resources

Buildings, Infrastructures, teaching and practical rooms are of excellent quality, thanks to European structural funds. The Estonian University of Life Sciences possesses also a rather large group of field and forestry stations that allow summer study practices. The University offers also rich historical collections of specimens that are available for the courses and for research. An important suggestion would be to advertise the quality of these facilities to promote the programmes in a more extensive manner, especially for international students.

There is no major limitation to financial resource; however, the committee noticed that there are limitations associated with their organization. Not all laboratories are fully under operation, with respect to international standards, resulting in limited use for the students. Financial resources for practical are not sufficient and the teachers have to use laboratory funding. Also it would be important to enrol more private or public partners for the practical training courses of the Master Students.

Teaching

The students are satisfied with the methods for assessment of learning outcomes, which is both objective and transparent. The supervision of the students is good and personalized, especially at Bachelor level. Teaching is flexible, but more mutualisation between programmes from different institutes could be obtained, making flexibility less costly for the institution.

Based on previous consideration on the use of the resources and infrastructures, the share of laboratory work, practice and practical courses is not optimal.

The Institution has the clear ambition to establish modern didactic methods, (e-learning, problem-based learning). Those methods are implemented in several courses (e.g. Nature Conservation, Ecological Carrying Capacity, Ecological Restoration, Design and Management of Development Projects, Management of Tourism), but their use is still heterogeneous depending on the programmes and should be further enforced in all of them. This should in principle be feasible as these methods are more and more popular among the teaching staff.

Despite several Erasmus agreements international mobility is low. As previously stated, the Institution should take advantage of the very nice infrastructure and specificity of the programmes to improve this dimension. As well more courses in English could be given to allow both inward and outward international mobility.

Staff

The teaching staff has adequate qualifications to achieve the objectives and learning outcomes and to ensure quality and sustainability of the teaching and learning. This is attested both by the teachers CV, as most of them have a

PhD, as well as by the very positive overall assessment by the students. The age pyramid is well balanced. Most of the Estonian Staff has international experience and is involved in international cooperation networks and projects. Several international staff members are also present. The overall rate of publication of the staff is good according to international standards. The modern infrastructures and the presence of an ERC grant in the Institution should help to intensify the staff productivity.

From the different discussions with the panel members, the teaching staff appears to be very implicated and motivated. In some programmes a fair amount of research scientists participate actively in the courses (e.g. Applied Biology).

Young teachers have passed university courses 'Pedagogy of higher education' and 'Practice learning in university teaching' during their PhDs. Taken together, the teaching staff is engaged in professional and teaching-skills development, this is however unequal among the different programmes.

Although co-operation between departments and institutes is necessary and encouraged, it is not always optimal (e.g. very good for Management of Urban and Industrial Landscape, which is taught by lecturers from three departments, but limited for Applied Biology). Such a lack of co-operation can, to some extent, be triggered by the competition for resources within the university. This can result in lack of dialog and some unnecessary redundancy of courses. This situation is also reflected by the multiplicity of BA and Master's programmes, as earlier stated in this report.

Students

From the discussions with the panel, the students appear very active and are mostly satisfied with their programmes, the professors and the University in general. They are actively asked for feedback. However, the number of students participating in those surveys is quite low. The chain of decision is rather long if organizational changes have to be implemented, but in parallel, there is a fluid personal communication between students and professors that allows rapid minor adjustments.

Too few students study abroad and in courses in English appear to be in limited number and mostly directed towards foreign students only. This compromises inward and outward international mobility.

Dropout rates are quite high, especially in the early years. As in most Estonian higher education institutions, this is due to a combination of economical, motivational problems and low academic success. Some students feel that the redundancy and or inadequate quality of some courses could encourage dropout. The management is well aware of these problems and tries to implement actions to counteract them. This consists in better information and in some cases, specialists from the Academic Affairs Department contact dropout students to help them finding solutions and to bring them back to University. The success of these actions is limited but this is a difficulty issue. For similar reasons a

significant amount of students does not graduate in time (e.g. Applied Biology, BSc).

In some cases programmes lack attractiveness, resulting in low student numbers, which are not simply due to the demographic trend (e.g. Applied Biology Master).

UNIVERSITY OF TARTU

Programmes

The University of Tartu offers 7 programmes, at the BSc and MSc levels. Taken together, the study programmes are of very good quality and their organization and contents are adapted to the learning outcomes. They all start with a significant amount of basic scientific subjects and then offer more specialized courses. The different parts form a coherent whole from a scientific perspective.

Gene Technology and BioMedicine share theoretical foundation and largely common targets in job market. They compare very well to similar programmes in other countries. They are connected with internationally recognized high level research, excellent equipment and infrastructure. This provides the students with a very stimulating atmosphere.

The objective of the Bachelor in Biology is to provide general education that enables a graduate to continue mostly in a Master degree. Learning outcomes are centred in knowledge, understanding and use of Biology. No real specialization is provided. While the curriculum contents are mostly sound and complete, this programme needs reorganization. In this context, the merging of Biology with the EBC programme should be beneficial for these curricula.

Two study programmes in Environmental Technology (ET) are in the group of Environmental Protection at the University of Tartu. The main objective of bachelor's programme in Environmental Technology is to provide academic education in natural and environmental sciences that enables a graduate to continue studies in the master's programme. The Master's programme in ET is giving narrower and more in depth specialist level education in ecological engineering, microbial processes technology, geo-technology, ecosystem technology, waste technology or environmental monitoring.

It has to be noticed that all programmes are spread in a multiplicity of 3-4 ECTS courses. This enables the students to have multiple choices. However, this is detrimental for the self-consistency and readability of the programmes. From the interviews with staff members and students, the evaluation panel felt that this was mostly due to individual and historical reasons and urges to merge these courses into larger and more consistent assemblies.

These programmes also appear to be still oriented towards research/academic careers and needs to find a more optimal balance vs. meeting

the more varied needs of the wider job markets. In this context, an enterprise practice combined with an entrepreneurship course is offered as an option in the GT programme. Such a course is highly beneficial for future employment in biotech industry, but the number of places available appears to be very limited and this course is therefore not available for all students who wish to follow it.

The Institution has made a strong effort to gather and incorporate the systematic feedback from the students and to implement their remarks. This is very efficient when changes in courses contents or lecturers are required but can be slowed by structural considerations when larger adjustments are needed.

For all programmes, the international dimension of the degrees has not been enough developed. The use of Estonian as the teaching language hinders internationalization of the Master´s programmes, including admission/exchange visits of foreign students.

As stated in the SER and discussed during the committee visit, the two Master programmes in Gene Technology and Biomedicine need to be better differentiated. From the visit, the panel was satisfied to learn that the Biomedicine programme was now modified to incorporate a larger amount of courses from the Faculty of Medicine. It is important to keep this process, which had been slowed by organizational obstacles between the two faculties, well on its way.

Resources

The infrastructures are excellent with new and/or fully renovated buildings, which offer all modern facilities and equipment both for teaching, practical and laboratory work. Those are widely in use by an active community of scientists and students. Students are allowed to use these infrastructures very freely. Such a large amount of trust indicates that students are properly trained and creates the conditions for their autonomy. Taken together, the infrastructures and the way they can be used constitute a very stimulating environment that contributes to attract very good and highly motivated students.

As it is the case in many institutions, the funding for practicum is not fully sufficient and the costs are at least partly covered by research funding. This is sustainable as long as the research funding is sufficient, which is presently the case. For the programmes in Environment Technology, the buildings are not as great, in particular auditoria and laboratories, in 46 Vanemuise St. As well materials for practical courses and lab trainings could be improved.

E-learning environment (Moodle) is widely available and actively used as a support for teaching and learning in GT and BM programmes. Its use is more sporadic for the Biology Programmes.

Teaching

The students were satisfied with the methods for assessment of learning outcomes, which is both objective and transparent. The teaching process is flexible and modular as the students can choose among a large diversity of courses. This is very positive. However, the small size and multiplicity of the courses may make the construction of the students' curricula (e.g. Biology) more complicated. Identifying larger assemblies of courses should therefore help in this process, while keeping enough flexibility. Previous studies and working experience are recognised through a transparent process.

The level of teaching is good but there is little information about teaching methods. The overall impression from SER and discussions with staff and students is that mostly traditional approaches are followed. In this context, both the institution and programmes promote the reduction of traditional teaching in favour of increasing other learning activities. During interviews, the students indicated this shift in teaching has not yet been widely implemented. At present, up to 50% of the students may prefer not to attend the courses, and instead, study the corresponding powerpoint presentations on their own. This mirrors the fact that the courses are not enough based on problem solving and interactivity. The students are also moderately satisfied with the communicational and the professional skills that they can get through the programmes, especially at the Bachelor level.

In conclusion, all programmes face similar challenges in shifting the teaching processes for subject/lecturer-oriented topics towards student- and learning-centred activities. This process should benefit from the large reform that is led by the vice rector. This will include the development of transversal skills, using flip-classroom approach, increasing the share of practical work, problem solving in groups, etc.

All Master Thesis are based in experimental work and some of them may even result in publications in scientific journals. In contrast several Bachelor Thesis are based only in literature, in particular in the Biology programme.

As previously stated, the use of English is also too limited, although the panel felt that the students English was excellent during the interview

Staff

The staff has a solid academic training and is often involved in intensive research activity, according to international standards, in fields relevant to the study programmes. Certain staff members are internationally visible colleagues with strong publication records. Together will the excellent resources, the presence of top-level researchers is very stimulating for the students. In contrast no comparable emphasis has been put on the development of pedagogical skills. CVs do not indicate pedagogical training, and unsatisfactory pedagogical skills have been mentioned both in the SERs and during interviews with the students. Additionally, the teaching skills of the PhD students are often ill perceived. The

University of Tartu organizes and offers several pedagogical courses, which are well appreciated by the teachers who followed them. More active participation in these courses would be welcome.

Students

For GT and BM, the students are clearly aware that they have been enrolled in a highly demanded programme with an excellent reputation. As earlier mentioned, GT and BM are connected to high-level research. Consequently, these curricula don't suffer from the demographical decrease and are filled with excellent and highly motivated students. However the Master´s programme in Biomedicine has received quite unfavourable evaluations, the main reason being its lack of sufficient medical contents, but this matter is under improvement.

Attractiveness appears lower for the Bachelor and Master of Biology where the demand has substantially decreased and is well under the number of positions offered.

For Biology, a significant part of the students does not graduate in nominal time, both at Bachelor and Masters levels. As previously stated, these programmes need reorganization.

External Mobility is very low. During the discussions with the panel, students from BM and GT reported that one of the main problems was that they were asked to find abroad programmes whose courses would fit exactly with those of the corresponding year in Tartu. As this is nearly impossible the students degrees would not be validated and taking abroad mobility would result in the impossibility to graduate in time. Such an obstacle should be removed to enhance external mobility.

Finally, the panel was impressed by the outspokenness, healthy critical attitude and excellent English demonstrated by the present and former students of the programmes. This finding in itself serves as an evidence of good University education received.

Summary of Conclusions and Recommendations

(for both Estonian of Life Sciences and the University of Tartu).

The committee felt that the self-assessment reports were of good quality. They were written in a very honest and transparent manner and did not avoid difficulties. Taken together, they provided a large amount of information on the different aspects of the programmes. Sometimes information appeared to be not precise and/or factual enough (lists of employers, exact compositions of councils, distribution of responsibilities, prestigious grants received by the institutions)

and/or could be slightly confusing. Such occasional problems are pointed in detail in the specific reports for the different programmes.

The visits were very well organized, with a very good and positive working atmosphere between the committee members and all the members of the two institutions (including students). This resulted in very open discussions that were made easier by the very good ability to communicate in English from both students and staff.

The programmes examined by the evaluation panel showed very contrasted differences between the two institutions. The University of Tartu has a strong tradition in high-level international science, essentially in the field of molecular biosciences, while The Estonian University of Life Sciences is more orientated towards applied biology, landscape and forestry. This is an interesting complementarity, which should be beneficial if the two institutions take it as an opportunity to expand their collaborations.

Besides these differences in aims and history, the committee noticed that the two instructions share several positive features as well as several areas for improvement. Those are recapitulated below.

Both Institutions share the common point to have very modern infrastructures. Such and attractive and stimulating environment is an important asset. It is at the core of the excellent reputation of the research-orientated Tartu University programmes.

This should be further exploited in particular to attract more foreign students. In this respect, more courses should be taught in English. Students felt encouraged for outward international mobility at the Estonian University of Life Sciences, while it was more difficult for the Students of the University of Tartu. This point could easily be improved, given the International visibility of the research carried in this institution.

Both Institutions offer sound programmes that are self-consistent and are taught by a dedicated staff. Teaching is at crossroads between traditional methods and more modern/student centred pedagogy. This transition is unequally implemented for the Estonian University of Life Sciences programmes and seems to be slow for the programmes of the University of Tartu. The most obvious reasons seems to be that the staff is very intensely involved in research, making it sometime difficult to invest enough time and energy in upgrading teaching practice and methods. For both institutions, these efforts should be continued with perseverance.

The committee noticed that both institutions still display a rather fragmented teaching offer, but of different nature: Estonian University of Life Sciences has a too large number of programmes for its size, whilst the larger blocks constituting the programmes of the University of Tartu are composed by a multiplicity of small courses (which can be found also in some programmes of the Estonian University of Life Sciences). In both cases, the committee advises for a strong effort of reorganization to make the contents more readable for the students, for the future employers and to limit unnecessary overlaps.

1. Assessment report of Life Sciences SPG at Estonian University of Life Sciences

1.1. Applied Biology and Aquatic and Terrestrial Ecosystems (Bachelor/Master)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Comments

After 10 years running, the Bachelor and Master Applied Biology and Aquatic and Terrestrial Ecosystem study programmes were restructured in 2013. They incorporated two specialties, the practical courses increased and they were enriched through the participation of new human and infrastructure resources, mainly from the Institute of Agricultural and Environmental Sciences.

The self-assessment report provides limited and occasionally confusing information on the content and structure of the Bachelor and Master Study programmes. Description of the Bachelor curriculum (SER App.1) includes courses into modules, but the corresponding credits of these courses do not always match with the total for the modules. Following, the study plan (SER App. 2) fails to include a 3 ECTS basic course mentioned in App 1. The self-assessment has not been reviewed to correct misinformation, thus it fails to prove a convenient programme development.

On the other hand, the content and structure of the present study programmes are overall consistent with the objectives and learning outcomes. However, basic science courses (e.g. chemistry) are not included in a curriculum, which incorporates very specialized courses (e.g. environmental chemistry). Also, the numerous courses with few ECTS demand a high organization effort. Moreover, for the Bachelor students the total ECTS varies greatly among semesters (SER p.64-65). The programme is to be structured with an even distribution of ECTS

among all semesters. The only uneven semester is the last one, in which the students are to have extra time to work for their Final Thesis.

Master students choose specialty and also 10 ECTS within the elective study module. The offer of 40 ECTS in 12 courses is very high for the low number of students and may lead to courses with an average of ca. 2,5 students. Another matter of concern is that not all courses offered are equally available: in the first semester students take 29 ECTS and in addition they are offered 4 courses of 2, 5, 2 and 4 ECTS, respectively from the elective module specialty (SER p 67). Therefore some of them are mostly unavailable for the students (e.g. "Algology", 5 ECTS for aquatic ecosystems students) unless they increase their total ECTS to 34; equally, in the second semester "Environmental policy and strategy" (5 ECTS) is unavailable for the terrestrial ecosystems students unless they increase their total ECTS to 39 (SER p. 67).

Presently, the Bachelor programme demand fits with the positions offered and provides a preliminary specialization (p. 11, Table 1.6.2). Meanwhile, the low demand of the Master programme is recognized as a problem to overcome, although the causes and the corresponding corrective measures are not evidenced in the SER. One possibility is that the Bachelor already provides the students with some specialization. On the other hand, the managers of the programmes are active and successful in organizing Bachelor promotional activities in secondary schools, while no promotion of the Master Programme has been done for Bachelor students.

The Bachelor and Master Study Programme development take into account feedback from students, employers, alumni and other stakeholders. The fluid collaboration among all the actors involved in the process has allowed identifying and overcoming some temporary problems and there are no serious drawbacks. Nevertheless, structure development for the control and efficient organization of the programmes is weak; transparent mechanisms to avoid a very directed and personal dependence for taking actions should be ensured.

Strengths and Areas of Improvement

Strengths

- Programmes are well established and derive from others upon which improvements have been made
- The content and structure of the study programmes, including two specialties, are consistent with the objectives and learning outcomes
- Professors belong to the different areas contributing to the programmes
- The Bachelor programme demand fits with the positions offered
- Both programmes take into account feedback from students, employers, alumni and other stakeholders

Areas of improvement

- The self-assessment report provides limited and occasional confusing information on the content and structure of the Bachelor and Master programmes
- The curriculum includes very specialized courses without previously offering basic science courses
- The Master programme fails to attract students
- The SER shows imbalance in the ECTS per semester, especially for the Bachelor programme
- Interaction between subjects is weak
- Considering the low number of students, the Master programme offers many elective courses for the ECTS required
- For Master students, not all elective courses offered are equally available unless they enrol in a high number of credits per semester
- Structure development for the control and efficient organization of the programmes is weak

Recommendations

- Provide clear information on the courses and ECTS per course and semester students are to take
- Review the relationship among courses, ensuring that specialized courses are taken after basic science knowledge has been acquired
- Review the distribution of ECTS between courses and semesters for both programmes. Provide a balanced calendar of ECTS per semester. Allow extra time in the last semester to work for the Final Thesis
- Address the low demand for the Master programme and urgently implement measures to result in an attracting programme. Promote the Master programme
- For the Master programme, organize the ECTS distribution to allow students choose any of the elective courses without increasing the ECTS they enrol in a given semester
- Establish mechanisms to address a higher interaction and organization between subjects, especially reducing the number of courses and increasing the number of ECTS per course
- Increase structure development for the control and efficient organization of the programmes

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the

achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Comments

The recent strong investment in renovating buildings, teaching rooms, laboratories and equipment has allowed a significant overall improvement. Resources are good or excellent. Infrastructures allow access for students with disabilities. Some facilities hold rich historical collections of specimens appropriated for the courses. However, programmes are not fully provided in one but in several locations even 50 km apart from each other and there are no transport facilities; communications are complex and unsatisfactory for students.

Human resources are overall numerous and diverse. Both the human and the structural and equipment resources allow the programmes to organize activities in groups of variable sizes that optimize the teaching process, including summer study practices. The Master programme includes a 5 ECTS compulsory course "practical training in specialty", to fulfil this course the students go to different institutions out of the EMU and use external facilities. The libraries in the different dependencies where the programmes are running include the materials required by the students. Technology Information Systems are improving to provide easy access to these materials and WiFi is available in all locations.

Laboratories have been renovated in the previous years and some of them offer excellent opportunities for the students, but not all of them are fully under operation and still offer limited use for the students. The programmes should take full advantage of these excellent resources.

Strengths

- New or renovated buildings, fully equipped lecture halls
- Infrastructures allow access for students with disabilities
- In the Master compulsory course "practical training in specialty", the students go to different institutions out of the EMU and use external facilities
- Rich historical collections of specimens available for the courses
- Group size for the different activities is considered
- Students carry out several summer study practices under the supervision of professors and in several locations

Areas for improvement

- There are limitations associated to the organization of the resources. Not all laboratories are fully under operation and still offer limited use for the students
- transportation systems among the locations of the study programmes is not efficient
- In spite of the low number of students, there are limitations in finding institutions where the students enrolled in the "practical training on specialty" course may participate

Recommendations

- Work to facilitate mobility among locations or analyse the feasibility of relocating part of the teaching process to one location or to very close and well-communicated locations
- Use the full potential of all laboratories and equipment in them for the development of practical abilities of the students
- Increase the institutions where master students may participate within the practical training course

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Comments

Results from students' surveys are partly available for the teaching staff and are discussed in the Study Development Commission to improve the programmes. Potential employers' opinions are also considered.

A diversity of teaching methods is used. However, the share of laboratory work, practice and practical courses in the programmes is mostly low and lower for the Bachelor than for the Master programme. The programmes do not specify the

total share of the different teaching activities to be carried out, nor do they inform on the percentage of every activity per course. Detailed information on the specific methods per course should be known and public. Assessment of learning outcomes is transparent and objective and the programmes include a system for recognition of prior learning and work experience.

Supervision of individual student work is good or very good in the Bachelor. Some limitations in the Master supervision have been solved on a personal basis. Ex-ante organized structures to confront with the problems at the time they are identified should be developed. The organization and improvement of the programme should not rely in personal driven actions.

The programmes identify the courses that are relevant for every learning outcome of the Estonian Higher Education Standards (SER App. 3) but no relationship between the curricula specific learning outcomes (SER App. 1) and the individual courses is established. It is not possible to know how some learning outcomes (e.g. "leading team work", "communication skills", "explain orally… in one foreign language…and participate in professional discussions", "create interdisciplinarity", "show initiative…") will be achieved through one or more of the courses mentioned (e.g. "Estonian birds", "Estonian insects", "English for specific purposes"). In addition, the students enrol in the courses relevant for communication (e.g. "General course in communication psychology", "English for specific purposes") in the Bachelor early semesters, where the specific knowledge of the subjects has not been provided yet; thus the courses are likely to be not specific but general.

The process of teaching and learning allows mobility of the Estonian students, but in practice it is low. Also, the courses in Estonian language do no facilitate mobility towards the programme and the international dimension of the programmes is not allowed. There are a very limited number of courses in English and for foreign students only. This also compromises foreign institutions agreements willing to provide students for the programme.

Implementation of modern didactic methods is still limited (SER p 44). E-study methods have been recently introduced, and there has been an increasing development of e-based learning courses that has to be monitored in terms of use and satisfaction, both for professors and for students.

Strengths and Areas for improvement

Strengths

- The Study Development Commission of the programmes considers students and employers surveys to improve the programmes
- Assessment of learning outcomes is transparent and objective and the programmes include a system for recognition of prior learning and work experience

- Supervision of individual student work is overall good, especially in the Bachelor programme

Areas for Improvement

- Results from students' surveys are not available extensively: all surveys are not made public to everybody related with the degree
- Although no limitations in infrastructures or human resources are evidenced, the share of laboratory work, practice and practical courses is low
- The total share of the different teaching activities in the courses is unknown
- Specific limitations in the teaching and learning process are solved on a personal basis. The programme excessively relays in personal driven actions
- The programmes do not establish the relationship between the curricula specific learning outcomes and the individual courses
- Mobility is low. The programmes do not develop an international dimension
- Implementation of modern didactic methods and e-based learning courses is still limited

Recommendations

- Provide public information on the processes and procedures followed to improve the functioning of the programmes
- Study the areas in which increasing laboratory work, practice and/or practical courses will benefit the programmes, and implement them
- Provide public and accessible information to anybody interested in, also to prospective new students, on the total share of the different teaching activities carried out per course
- Develop ex-ante organized structures to confront with the potential problems at the time they are identified.
- Establish clear and specific relationships between the individual courses and the learning outcomes of the programme and of the Estonian Higher Education Standards learning outcomes
- Promote and facilitate mobility of Estonian students and increase courses in English
- Monitor the implementation of the e-based learning courses

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Comments

The teaching staff is adequate, qualified to achieve the objectives and learning outcomes of the study programmes, and to ensure quality of the teaching and learning process. The students are satisfied with the professors. While the age distribution in the Master study programme is well balanced, the distribution of the age pyramid for the Bachelor study programme is imbalanced, with only 3 teachers under 35 years and 16 out of 46 (35%) 60 years or over. While these teachers are fully experienced and may be invaluable for the present teaching process, the programme urgently needs implementation of measures to recruit new staff to start acquiring teaching skills by participating in the programme. Otherwise, the future of the programme is seriously compromised. The rate of PhD teachers in the Bachelor programme is very high; it is considerably lower in the Master programme.

The leader of the curriculum is an experienced professor. He holds major responsibilities, not only by leading all or most aspects of the programme, but also by being directly involved in teaching part of 14 courses (SER App. 12). However, a programme that would share and distribute the responsibilities in a joint cooperative way among a set of selected experienced professors could wider benefit from an interaction and balanced mixed perspectives; more relevant, a wide base support instead of an outstanding but individual support increases flexibility and management in the near future.

Curricula include the participation in the programme of some external professors from other Estonian Universities or Institutes, and only occasional visiting experts from abroad (SER p. 43, only 1 mentioned). Permanent teaching staff training has not been considered an essential need within the programmes

Strengths and Areas for Improvement

Strengths

- Most professors are PhD, especially in the Bachelor programme
- Qualified teachers and researchers from a variety of departments and institutions are involved in the programmes
- Students are satisfied with the professors
- The age distribution of the teachers participating in the Master programme is well balanced
- The teaching staff is leaded by an experienced professor

Areas for Improvement

- The percentage of professors not holding a PhD in the Master programme is relatively high
- The age distribution of the Bachelor programme teachers shows experienced and relative aged professors; young professors have not been incorporated
- Management of the programmes relies mostly on a single professor
- Only occasional visiting experts from abroad
- Permanent teaching staff training has not been considered an essential need

Recommendations

- Increase the percentage of PhD professors for the Master programme
- Address the Bachelor programme future sustainability in terms of the age of the teachers. Implement a plan to recruit new teachers
- Extend the management of the programme by distributing responsibilities in a joint cooperative way among a set of selected experienced professors
- Increase the participation of visiting experts from abroad in the programmes
- Incorporate permanent teaching staff training. Encourage participation in these activities

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content,

form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Comments

Students entering the Bachelor and Master programmes fulfil the requirements and are satisfied with the programme. Demand for the Bachelor has been equal or over the admission number (SER p. 12). However, demand for the Master studies is insufficient (SER p. 12) and mostly limited to graduates from the Bachelor study programme; the Master programme fails to attract enough students.

Overall, there are motivated students and professors, but the dropout is high and the graduation rate on time is low both for the Bachelor and for the Master programmes (SER p. 12), and a significant number of students interrupt their studies. Reasons for interrupting studies are personal ones or lack of motivation, dissatisfaction with the study programme or low academic progress (SER p. 45). These problems have been addressed individually, but so far there is no evidence of success. Motivation is recognized as a key point to improve along the programmes.

Students participate in the management structures of the programmes and the low number of students facilitates personal communication with professors. This is a value of the programmes but it should not compromise the development of structures to assist in the processes. Students are satisfied with the curriculum and Master students are particularly satisfied with the "Practical training in specialty" course. However, the participation in the surveys is low (SER p. 31). Students also show satisfaction with the resources and with the supervision process in the Bachelor studies but considerably less in the Master. The reasons have been identified but no specific measures to improve supervision have been introduced.

Several sources of information or help structures are available for the students, including available information about the courses at the beginning of the term. The Tutor Network System may help incoming students with the integration into the academic environment (SER p. 46); scholarships and learning and training possibilities are found is the ISI, and there is Erasmus coordinator (SER p. 46).

The programmes frequently rely in close individual knowledge of the follow-up of the graduates and their employment, and it is known that there are a number of graduates working in relevant institutions or pursuing PhD degrees (SER p. 45). However, employment information is not systematically collected and employment rates of the individual programmes are not provided in the self-assessment report.

Strengths and Areas for Improvement

Strengths

- Demand for the Bachelor studies is equal or over the admission number
- The students are mostly satisfied with the programmes, the professors, the resources and most of them with the supervision
- Students participate in the management structures of the programmes
- Students are asked about the programmes, the lecturers, etc. to improve the programmes
- There is a fluid personal communication between students and professors
- Master students are fully satisfied with the course "Practical training in specialty", which allows them to participate in activities of companies related with the curriculum
- Several sources of information or help structures are available for the students

Areas for Improvement

- The Master programme fails to attract students
- The dropout is high and the graduation rate on time is low for both programmes
- The participation of students in the surveys to improve the programmes is low
- Satisfaction with the supervision in the Master programme is not always good
- The programmes frequently rely on close individual knowledge
- The programmes do not collect quantitative data on employment rate of graduates

Recommendations

- Work to increase the demand of the Master programme
- Address the programmes contribution to high dropouts and for not graduating on time
- Establish measures to raise motivation for students and for supervisors
- Encourage students to participate in surveys to improve the programmes
- Implement measures to improve the supervision process in the Master programme
- Systematically collect quantitative data on employment of graduates

2. Assessment report of Environmental Protection SPG at Estonian University of Life Sciences

Characteristics of the Environmental Protection programmes at EMÜ

EMÜ was subjected a changeful history since its foundation as Tartu Veterinary School in 1848. In 1919 the institution was merged with Tartu University and in 1951 it was separated again as the Estonian Agricultural Academy. After the second independency of Estonia in 1990/1991 the Estonian Agricultural Academy was reorganised to receive university status again (first: University of Agricultural Sciences; currently Estonian University of Life Sciences). In 2005 the academic structure of the university was reorganized with the intention to replace faculties as classical structural entities by institutes promising a closer nexus to research and teaching. As a result five institutes were founded. The Institute of Agricultural and Environmental Sciences is responsible for the study programme 'Environmental Protection'.

The study programme 'Environmental Protection' comprises a broad range of different bachelor and master programmes. This is a great potential for the students' individual specialisation within the field of environmental protection. The programmes include:

Environmental Protection (BSc);

Environmental Planning and Landscape Design (BSc);

Nature Tourism (BSc & MSc);

Natural Resources Management (BSc & MSc);

Management of Urban and Industrial Landscapes (MSc); and

Landscape Protection and Preservation (MSc).

While the Natural Resources Management Programmes strongly focus on the natural sciences, the other programmes are more interdisciplinary, partly focusing on specific methodological approaches (e.g. planning & design or protection & preservation) or focusing on specific activities (e.g. nature tourism) or areas (e.g. Management of Urban and Industrial Landscapes). EMÜ's mission is to guarantee a high academic quality of the study programmes.

All programmes are governed by the Head of the Curriculum (one of the professors) and the Curriculum Committee that includes student members. Together they frame the structure and the objectives of the programmes and monitor and control its quality and that of separate courses. Initiatives for new courses or elements generally come from a professor or lecturer. Small changes in a course can rapidly be done by the responsible lecturers, who have much autonomy and independence in shaping the individual courses that they are responsible for. Larger changes are discussed and approved by the Curriculum

Committee. Adding new courses or changing the curriculum of a programme has to be approved first by the Institute's council, especially when such changes have major financial or personal consequences and subsequently by the education Council of the university. Adding new programmes to the curriculum has to be approved first by the education Council of the university and subsequently by the Ministry of Education. This governing structure is relatively flexible, has clear responsibilities and guarantees the timeliness and quality of programmes and its courses. The frequent student evaluations provide essential input. Although students do not always know who their representatives are in the committees, the Assessment Panel got the impression that professors, lecturers and student representatives listen and respond to comments and suggestions.

Summary of Conclusions and Recommendations

The Environmental Protection programme (BSc) includes both a natural science and professional profile. The programme is well governed and director, staff and students are all involved in the programme's improvement and further development. The Assessment Panel was, however, critical on the many short courses and the lack of coordination between courses. This could result in unnecessary overlap fragmentation and repetition. A more coherent programme with larger blocks should ideally be developed.

The Environmental Planning and Landscape Design programme (BSc) is well-organised with a clear professional profile. Suggestions made by the Assessment Panel comprise the idea to rethink the programme denomination as well to increase the co-operation between teachers as well as an improvement of resources, including the available budget.

Both Nature Tourism programmes (BSc & MSc) have very specific, but reasonable and clear profiles. Teachers and students are highly motivated. Further development of the programme will be cooperatively managed by EMÜ, including students, and professionals.

Both Natural Resources Management programmes (BSc & MSc) train experts to manage Estonia's natural resources. Several courses are already taught in English to attract foreign students. The programmes are well imbedded in the international SILVA network. Teaching methods are generally traditional and more modern methods should be developed and implemented. Finally, the Assessment Panel found that the programmes' visions were not very advanced and should be further developed. Proper visions could also help to improve the programmes and reduce some if their fragmentation.

The Management of Urban and Industrial Landscape programme (MSc) has a specific spatially and problem oriented – and therefore reasonable – profile. Continuous modernization of the curriculum in order to offer a research-based university education and to guarantee the optimal ratio between fundamental and special applied courses is recommended.

The Landscape Protection and Preservation programme (MSc) strongly combines the scientific theory with practical applications. Although several courses are taught by renowned international lecturers, the programme focuses on Estonian

nature and landscapes. Most lecturers are also good and internationally-oriented researchers and bring this experience into their course and practical work. Drop-out rates are reduced by using research assistant scholarships from research projects. The Assessment Panel found that the programme was not fully comprehensive and consistent, and that a more coherent programme with fewer but larger courses should be developed and implemented.

2.1. Environmental Protection (Bachelor)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Comments

The Bachelor programme 'Environmental Protection', which is the oldest such curriculum in Estonia, is organized since 2002 by the Institute of Agricultural and Environmental Sciences under the leadership of Prof. V. Kuusemets, and involves a full-time learning programme that balances basic natural sciences with hands-on environmental management. Good links with ministries, the Environment Board, Agencies, companies and municipals ensure that the applied character of the programme is guaranteed. This was supported by the alumni's statements that the Assessment Panel spoke to. These active links also enhance job opportunities for the students. A maximum of 40 students is admitted annually and 135 students currently participate in the programme.

The programme is reviewed annually by the programme leader and Curriculum Committee. Student's evaluations and feedback from alumni are used and appreciated. The Assessment Panel found that the interactions between programme leader, teaching staff and students was good and frequent. This should lead to an evolution and continuous improvement of the programme. However, over the years the programme has become fragmented through the proliferation of many short courses. Although this can increase selection possibilities for students, it has also resulted in overlap and lack of coherence among courses that are taught by lecturers, especially those that stem from different departments. The Assessment Panel learned during the discussions that

changes in courses were frequently initialized by individual lecturers, who seem to have a large autonomy to control the actual content of their own courses. This proliferation of many short and overlapping courses could also be triggered by the lack of a clear vision in the programme's Self-Evaluation Report on the necessary knowledge and skills that the BSC Environmental protection students should obtain as graduates of the programme.

Plans exist to stimulate excellent students with additional individual study tasks to increase their research skills and enhance their knowledge. Some additional money from research projects can be used to actively involve those students. This is one way to decrease drop-out rates.

Strengths and Areas of Improvement

- The link between the programme and practical training at local, regional and national levels, and with municipals, companies and agencies are excellent;
- Although the programme is continuously evaluated and improved, a clear vision of the scope and desired outcomes of the programme is lacking in the Self-Evaluation Report; and
- Although numerous topics are taught in many different courses, coherence in the programme seems to be lacking.

Recommendations

- The Assessment Panel recommends to develop a clear vision on the necessary knowledge and skills that the BSC Environmental protection students should obtain in the programme, and how these knowledge and skills should be integrated and balanced. Alumni and organisations that provide job opportunities for the students should be involved in the discussion leading up to such vision;
- Although regular roundtables are already planned, coordination between all lecturers, including those from different departments, should be further improved; and
- The Assessment Panel strongly recommend reducing the number of courses, developing larger more integrated courses and increasing the coherence of the programme.

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Comments

The available resources are manifold and support to achieve the programme's objectives. Financial resources are administered and controlled by the institute. The lecture, seminar and practicum rooms are good. In 2014 a new building was opened and laboratory facilities were recently renewed and are equipped up to modern standards. Three different field stations in different parts of Estonia are available. A satisfactory supply of textbooks, specimen collections (herbarium, mushrooms and insects), internet facilities (including e-learning) and other teaching aids (e.g. computers, GIS software, and microscopes) are available. The EMÜ students have also access to the libraries of Tartu University. However, the textbooks linked to some of the courses are a little dated (compared internationally) and do not cover the most recent practical and political developments of environmental protection, such as, for example, is recently legislated by the EU. The students would like to include more (international) excursions to get a better notion of how environmental protections works in practice, but the financial resources are limited.

Strengths and areas for improvement

- There are modern lecture, seminar and computer rooms. The latter are equipped with timely computer hardware and software; and
- The teaching staff is making a large effort to develop and make available e-learning approaches, such as the flipped classroom.

Recommendations

- Budget needs to be freed to stimulate the organisation of (international) excursions.

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Comments

Different forms of teaching are applied in the programme. These include contact classes, practical training and independent work. Recently lectures are being replaced by seminars and individual and group work, except for some of the basic disciplinary courses. Several courses later in the curriculum focus on obtaining direct work experience, sometimes undertaken in a company or other organisation. Sometimes field trips are organised generally in collaboration with the staff at the field stations. Gust lectures by professional practitioners are frequent. Skill courses, such as understanding the scientific method and scientific writing, are also taught. Lecturers, responsible for a course, document and schedule the courses, and describe the required pre-knowledge, teaching materials and assessment methods. Students are assessed for all courses. Most students select a topic at the start of the third year and develop an individual final thesis. Their research proposal and methodology is discussed and approved in the Research Methodology course. This thesis is orally defended in pubic with professionals, professors and other teachers that constitute the defence committee. Individual essays, products and theses are always checked for plagiarism and other academic fraud.

Strengths and Areas for improvement

- The programme has an effective study information system and the contact between teachers and students is excellent;
- There is an growing share of e-learning approaches, developed by the staff;
- The teaching balances theoretical, scientific and practical work and focusses both on developing knowledge, understanding and academic skills;
- Student assessment methods and checking for academic fraud are well developed and implemented; and
- Although students are stimulated to visits universities and do courses abroad, relatively few students use these opportunities.

Recommendations

- Although e-learning and other modern approaches are being developed, their share could well increase. This could also help students to attend virtual classes in their own desired time and reduce the drop-out rate (especially because a relatively large fraction of the students depends on a job to support them).
- The modern e-learning approaches, including different supervision skills for group- and individual tasks, require that lecturers and other teaching and support staff are also continuously trained in using and updating their own courses. EMÜ and its institutes should create more opportunities for such staff developments.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Comments

The staff is motivated, ambitious and well-educated: most of them have a PhD and are active researchers, as is demonstrated by increasing numbers of international publications. The further development of pedagogical skills by the staff is stimulated.

Because of the width of the programme, lecturers stem from different departments and institutes within EMÜ. Additionally, several guest lecturers and practitioners present their pragmatic work experiences in the field. This sometimes limits the coordination of courses within the programme. This was introduced to the Assessment Panel by the students, who indicated that not all guest lecturers fit well into the course.

Most lecturers are responsive to the student's evaluations, which is part of the Study Information System. If required the Head of the Curriculum and Department take action to mitigate problems. New academic staff with adequate expertise and qualifications is difficult to recruit. Competition between universities in Estonia and abroad is fierce and because of language barriers it is difficult to attract foreign staff.

Strengths and Areas for Improvement

- The qualifications of the staff members are diverse and good, and still improving through additional educational efforts, coaching and selection of young researchers (e.g. PhDs);
- The high teaching loads of younger researchers limits their research output and quality;

- Lecturers and teachers have much freedom to develop their courses. The Curriculum Committee defines the structure and objective but within these boundaries the teacher can select education methods, topics and lecturers;
- International exchange of lectures occurs and several internationally renowned scholars regularly visit EMÜ to teach as guest-lecturers; and
- Lecturers and scholars from other universities and several professional practitioners are involved in teaching.

Recommendations

- The programme should continue to use practitioners and scholars for other institutes, universities and organisations, but better coordinate their input and evaluate their performance; and
- Lectures should be allowed to actively develop their own research programme and supervise PhDs. This would strengthen the link between research and teaching, and could also increase the opportunities for and quality of the individual BSc thesis.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Comments

Although the students are generally enthusiastic about the programme and selected through a competitive process evaluating skills and motivation, the drop-out rate is still high. This is likely caused by the financial constraints of the students (few scholarships and relatively high fees for part-time students). Many have a non-academic job to support themselves. Although EMÜ tries to help and find solutions for these personal problems (c.f. Self-Evaluation Report, p47), drop-out rates remain high. This is not only a waste of talents, but also an inefficient use of teaching resources.

The students have established the Environmental Protection Students' Association (EPSA) of EMÜ in 2001 to improve professional skills, promote sustainability,

organise social events, student exchanges (e.g. with Lille in France) and summer and winter 'Academies' and link to similar groups in Estonia and abroad. Recently, all students interested in environmental issues can join.

Strengths and Areas for Improvement

- New students are relatively well informed on the scope and topics of the programme before they enter.
- The students' learning, mentoring and social environment is very good.
- Students have organised themselves socially and some participate in the Curriculum Committee but the course and curriculum coordinators could better utilize the students' organisation (e.g. EPSA) in the coordination and development of curricula.

Recommendations

- The drop-out rate must be reduced. This could be by creating more 'research assistant' scholarships as part of institutional research projects so that students can obtain research experience and inspiration, without having to focus on an unrelated outside job.
- EPSA could also be stimulated to more strongly keep in contact with alumni (together with EMÜ).
- Because many students are dependent on local jobs, study opportunities abroad are not fully utilized. Exchange with international universities should be more strongly stimulated.

2.2. Environmental Planning and Landscape Design (Bachelor)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Comments

The 'Environmental Planning and Landscape Design' is the most appropriate Bachelor programme to continue the study at Masters level in the field of 'Management of Urban and Industrial Landscapes', and 'Landscape Architecture', which is not included in the Environmental Protection Programme group. To ensure an efficient study course from BA to MA within the area of Landscape Architecture is important. Connections between both of the programmes should therefore not be neglected on the occasion of this evaluation.

Although the contents and structure of the study programme are absolutely consistent with its objectives and learning outcomes, the denomination of the programme does not fully mirror its content. The term 'environmental planning' comprises a very broad range of environmental planning approaches and instruments, including Environmental Impact Assessment, Strategic Environmental Assessment, sectoral environmental planning (e.g. noise abatement plans, water management plans and clean air plans), contents, which are currently not included in the programme. The term 'landscape design' very often is regarded as 'small scale landscape architecture' or landscape architecture with a strong (or one-sided) focus on design. Contrary to this, the study programme is much broader, including subjects from ecology, economy and social sciences according to international standards. Hence, both terms, 'Environmental Planning' and 'Landscape Design' do not sufficiently mirror the content of programme. The described reasons (Self-Evaluation Report, p. 31) for the denomination change of the programme from 'Landscape Architecture' to 'Environmental Planning and Landscape Design' are not self-explanatory or necessarily reproducible, because a university degree in landscape architecture is something different from an occupational union certificate 'landscape architect'.

The different parts of the study programme form a coherent whole; nevertheless climate and climate-change issues are addressed in some courses, but climate-change issues (impact assessment, mitigation and adaptation) are not explicitly included in the programme (Self-Evaluation Report, p. 94). The development of the study programme is based on legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being strived for, which is mirrored in a comprehensive and honest analysis of strengths and areas of improvement of the programme (Self-Evaluation Report, pp. 33, 34, 36, 37, 38, 39). The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Strengths and Areas of Improvement

- There is a good connection with the profession, locally and internationally.
- The teaching contents are updated continually, reflecting feedback from students, alumni, other professionals, and international scientific community.
- The study programme is based on course projects dealing with realistic planning situations; an integral part of these course projects is the final presentation and discussion of results.
- Co-operation within a few teaching subjects with other departments needs improvement.

- Students need a better theoretical basis for their Bachelor thesis.
- Ecology subjects should be supplemented by climate and climate-change issues (e.g. how to climate-proof and create more resilient landscapes).

Recommendations

- Co-ordination between involved departments concerning teaching subjects and contents should be improved, e.g. by regular roundtables for teachers from different departments.
- To develop a network of practical training and internship places in co-operation with national professional organizations.
- EMÜ should rethink the programme name. According to the contents of the programme 'Landscape Architecture' would be a more rational and clear denomination, contributing to a more logic system of study programmes within (and outside of) the Environmental Protection study programme group.

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Comments

Resources support the achievement of objectives in the study programme. This includes teaching and learning environments, such as good teaching spaces and studios with suitable furniture, teaching materials, teaching aids and equipment, such as computer class room for only students to do their coursework and individual exercises. Premises need some modernisation. Technical supply, including models could be improved.

There is a satisfactory supply of textbooks and other teaching aids (computers, printers and plotters) and they are available. Because of good security system, resources can be even used during late evenings or at weekends. Financial resources should be increased.

Strengths and areas for improvement

- There are good teaching spaces and studios equipped with suitable furniture;
- There is a computer class for only our students to do the coursework and individual exercises;

- The department has a good security with a coded alarm system so that materials can be left overnight and at weekends;
- Students are able to work late in evenings and at weekends;
- Building needs technical improvement;
- Better supply of textbooks available to students is needed;
- The campus could be better used (e.g. for green space management, experimenting construction and planting) and dendro-park in teaching.

Recommendations

- Building should be considered in the programme for renovations to ensure a better insulation and ventilation;
- Budget needs improvement for purchase of additional textbooks;
- Campus green space and dendro-park should be developed, e.g. by labelling the trees; using the green area next to the building for experimental constructions and gardening.

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.
- ✓

Comments

The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of learning outcomes, especially because the study programme is based on course projects dealing with realistic planning situations.

Modern teaching methods are mainly used in teaching. In single cases there were complaints about old-fashioned teaching methods and a missing willingness to

provide ERASMUS students with material written in English. Assessment of learning outcomes (including recognition of prior learning and work experiences) is absolutely transparent and objective.

Strengths and Areas for improvement

- During the visit the assessment panel got the impression that the study programme offers high quality courses, because different active learning methods are applied by many teachers. Another advantage is that foreign teachers are involved in the programme, who share their experience with students, which contributes to an international perspective in major parts of the programme.
- Areas of improvement comprise the need for a better cooperation and communication among teachers and the issue of practical training.

Recommendations

- On-line interactive teaching-learning environments e.g. Moodle, Wiki, should be more actively used for project coordination and information exchange;
- There should be more internal seminars among the staff to improve communication and cooperation, to explain each other's courses and to ensure that the linkages are strong;
- A better range of places which offer practical training should be developed.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Comments

There is teaching staff with adequate qualifications to achieve the objectives and learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning. Overall student assessment on teaching skills of the teaching staff is positive. Recognised members (including foreign and visiting members as well as PhD students in their specific field) of the teaching staff and practitioners participate in teaching the study programme. The teaching staff is engaged in professional and teaching-skills development.

Strengths and Areas for Improvement

- The teaching staff is qualified, partly with valuable experience from abroad. Some teachers are involved in international co-operation networks and projects. There is a good proportion of younger and elderly teachers. The assessment panel recognised that there is a good feedback on teaching by the students. Unfortunately the implementation process of new courses only focuses on research expertise of the teachers, while educational skills are not considered relevant. Teaching quality could be improved by a higher appreciation of educational issues, including the promotion of interaction between teachers and researchers, the further development of teaching skills of less-experienced staff, and the involvement of more external teachers with professional experience in teaching.

Recommendations

- The assessment panel recommends to offer opportunities for the further development of teaching skills, and to invite more external practitioners from different areas to have a more formal relationship in teaching, planning, and design project courses. Staff should be enabled to finalise their PhD thesis in time.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Comments

Student places are mostly filled with motivated and capable students. Dropout rates in early years are not very low. The proportion of students graduating within the standard period of study is relatively large. Students only partly study at other Estonian and/or foreign higher education institutions as part of their

studies, because they are afraid to loose credits, which could lead to sanctions. Employment rate of alumni is high. Alumni and their employers are satisfied with their professional preparation and social competencies.

Strengths and Areas for Improvement

- The presence of international students (mainly Master) contributes to create an international atmosphere of the department and enables local students to build up good international connections. Another strength is that students have created their own organization for landscape architecture students. Nevertheless, the number of applicants should be increased, to ensure a certain quality of admitted students. Finally, the dropout rate, especially in the first semesters of the programme should be reduced.

Recommendations

- The assessment panel suggests to improve information about the study programme to attract students not only from Estonia. Furthermore, programme co-ordinators should develop a concept for a comprehensive support of students including tuition relief, aiming at increasing the number of students encouraged to complete their studies.

2.3. Nature Tourism (Bachelor/Master)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Comments

Nature Tourism follows an interdisciplinary approach linking natural sciences, social sciences, and economy. It is mainly regarded as a consecutive study programme, starting with BA, and ending with MA, but for the Master programme also BA graduates from other programmes are admitted.

Both programmes have a very specific, but reasonable and clear profile. The aim of the BSc curriculum is to develop specialists with a diverse knowledge of Estonian nature including habitats, species, geology, soils and landscape, regional

development combined with an understanding of tourism organisation, marketing, socio-economic functions, and environmental legislation.

The aim of the MA programme is to broaden the geographic region to Baltoscandia and concentrate more specifically in carrying capacity, both social and environmental.

The content and structure of both of the study programmes (BA & MA) are consistent with their objectives and learning outcomes. Different parts of the study programmes form a coherent whole. Only, slight changes were suggested, for instance a stronger scientific focus, especially on research methodology was regarded useful by some teachers and alumni. The launch or development of the study programme is based on legislation, professional standards, development plans, and analyses, which includes labour market and feasibility analyses. The study programme development takes into account verifiable feedback from students, employers, alumni and other stakeholders. Many efforts are taken to consider students experience to improve the programmes. Each year round-table discussions are held with BSc students during the second half of the academic session to collect their feedback for the course review, feedback from the Study Information System is also taken into account. At the Master's level, an official roundtable meeting to discuss the positive and negative aspects of the curriculum is held at the end of the course, while feedback is also collected during the study period individually and actions are taken regularly (Self-Evaluation Report, p.59). This gives evidence that the best quality is being strived for.

Strengths and Areas of Improvement

- High intrinsic motivation of most teachers and students;
- Curriculum developed in cooperation with top-level international experts (Oxford University and Edinburgh Napier University) and benchmarked with similar curricula in Europe. The strength is high level of natural science education supplemented by social sciences, environmental law and economy that is also recognised by the Estonian Tourism Education Association;
- Tourism lecturers are involved in international projects where students have practice opportunities and from where they get themes for their theses;
- All information concerning curricula, study plans, outcomes etc. is provided in two languages Estonian and English while some E-courses in the Moodle learning environment are available in English and include learning materials;
- Integration between nature and social subjects can be slightly improved;
- Research methodology should be strengthened in the study programme at the bachelor's level.

Recommendations

- To better integrate natural and social sciences more emphasis should be put on project based learning;
- Further improvement of curricula by including research methodology at bachelor's level as well as invitation of Estonian Rural Tourism Association representatives to identify more themes for student group work and theses.

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Comments

Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme. Students can use institute and university library. There is a sufficient supply of textbooks and other teaching aids and they are available, although library is not yet sufficiently integrated in the learning process. Moodle is underused and considered not handy and complicated. There are three field stations that support the studies. New or renovated buildings create a convenient atmosphere. Some technical equipment needs improvement (audio, maps etc.). Resource development seems to be sustainable.

Strengths and areas for improvement

- Strengths and areas for improvement are connected suboptimal. Despite of the fact that new facilities have been created (auditoriums and WIFI; modern library and databases, electronic study system), there are still problems which should be solved: The library is not well integrated within the learning process and Moodle is underused. The Electronic Study Information System is not very often used by the students. There are 3 field stations in Puhtu, Võrtsjärve and Järvselja, but there is too much bureaucracy to arrange the study tours,

Recommendations

- It seems to be obvious that the library has to be better integrated within the learning process. Special courses should be offered to make students more familiar with Googledrive, Wikiversity, and other online platforms. Student feedback (in electronic Study system) should be obligatory.

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.

- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Comments

The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of learning outcomes, but there could be a stronger focus on research methodology. Modern methods are used in teaching. Few exceptions in the past recognised by student evaluation led to teacher change. Problem/project based learning is applied in several courses. For instance Nature Conservation, Ecological Carrying Capacity, Ecological Restoration, Design and Management of Development Projects, Management of Tourism (Self-Evaluation Report, p. 61). Field trips are included in many courses but there are also longer field practices, for example in Estonian Flora, Estonian Birds, Estonian Insects, Field Course in Mycology, Forest Ecology and Management. At Master's level most courses contain a field component, e.g. there is a three-day field course in the subject Nature in Baltoscandia (Self-Evaluation Report, p. 61). Individual practical training and understanding of tourism entrepreneurship is obtained through practical training and at the Master's level practical work in economic and social carrying capacity as well as practical course in nature tourism. The process of teaching and learning supports mobility. Assessment of learning outcomes (including recognition of prior learning and work experiences) is transparent and objective.

Strengths and Areas for improvement

- The study programme is based on problem/project oriented learning and includes specific highlights (3D mapping, field courses for wildlife studies, unique research topics). A wide range of practical training opportunities support theoretical subjects and increase the understanding of the programme as well as future career options. There were no complaints by the students about the credit point systems. Hence the assessment panel concludes that credit points are in line with real workloads. To encourage (international) student mobility the Master programme contains a dedicated exchange module. Students suggested that there should be more courses including field studies as well as research methodology. Besides, there are still difficulties with VÕTA (fill in and interpret documentation).

Recommendations

- The assessment panel suggests to further improve the BA curriculum by including research methodology and increasing the number of field studies in botany and zoology, especially for those Master students who did not graduate in the Bachelor Nature Tourism progamme.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Comments

There is teaching staff with adequate qualifications to achieve the objectives and learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning. The nature tourism curricula draw upon lecturers from several different institutes in the University, and there are sufficient highly qualified, motivated lecturers. The teaching staff includes many high level researchers and practitioners with PhDs and who use their considerable scientific and developmental experience to enhance their lectures. People from practice are involved in study process for delivery of single lectures or practical courses (Self-Evaluation Report, p. 62). Overall student assessment on teaching skills of the teaching staff is positive. Recognised members (including foreign and visiting members) of the teaching staff and practitioners participate in teaching the study programme. The teaching staff is engaged in professional and teaching-skills development. Lecturers are also all involved in development and/or scientific projects to develop their skills, knowledge and qualifications through attending numerous conferences and training. A number of teachers have benefited from training in the field of teaching proficiency; every five years teachers can use a teaching-free semester for this purpose. Young teachers have during their PhD studies passed in our university courses 'Pedagogy of higher education' and 'Practice learning in university teaching' (Self-Evaluation Report, p. 62).

Strengths and Areas for Improvement

- Lecturers are well qualified and willing to share their knowledge. Electronic Study Information Systems is analysed regularly. Student feedback is considered in decision making (one lecturer has been substituted). There are

engaged practitioners as well as lecturers from other universities among the teaching staff. The workload for supervision is unevenly distributed.

Recommendations

- Continuation of involvement of both specialists from other universities and practitioners;
- Regular analysis of feedback from the Electronic Study Information System;
- Further development of strengths – natural science and promotion of this specialisation in cooperation with Estonian Tourism Education Association.
- Joint seminars for supervisors and students.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Comments

Student places are filled with capable students. Dropout rate during the first semester is relatively high due to missing motivation of those students; later dropout rates are low due to high motivation and engagement of remaining students.

Students only partly study at other Estonian and/or foreign higher education institutions as part of their studies. Employment rate of alumni is high. Alumni and their employers are satisfied with their professional preparation and social competencies, but alumni network could be improved.

Strengths and Areas for Improvement

- Support of students has improved in different areas, e.g. state supported admission, health care, new university buildings for students with physical disabilities. These facts combined with group fieldwork and the opportunity for individual approaches within the learning process contributes to an increase of student motivation. Still, solutions to further reduce dropout rates and to increase study abroad rates are needed. Finally, the process of collecting information on alumni has to be improved.

Recommendations

- Recommendations comprise two areas of improvement: students, and alumni. To avoid student dropout a the reasons for student dropout have to be explored more detailed.To increase the number of students willing to study abroad more effective consultations to students on study abroad options have to be provided. Furthermore, an English Master's courses should be offered. Concerning the alumni, advanced training courses should be offered (provision of lifelong learning). Another topic is the improvement of alumni network to obtain more regular information on alumni.

2.4. Natural Resource Management (Bachelor/Master)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Comments

The Natural Resource Management programmes (BSc and MSc) are directed by Prof. Hardi Tulles since October 2010 within the Institute of Forestry and Rural Engineering and the Department of Forest Management. The programmes aim to train experts with profound knowledge of Estonian's natural resources and their management, even in a legislative context. The master programme adds additional disciplinary knowledge and approaches (e.g. modelling and monitoring) of the natural sciences and scientific research to project future changes and dynamics under various conditions. Basic knowledge of economics and law courses is included. This curriculum is unique in Estonia. Over the last few years some specialisations (e.g. Renewable Energy Resources, such as bioenergy) were discontinued. Collaboration with Forestry partners allow for a series of specialized forestry and forest management courses (with costs covered). Currently plans are discussed to increase the coherence of the curriculum and add more fundamentals of scientific research in the BSc programme. Discussions with

employers' representatives indicated that also public administration and legislative skills have to be improved.

Currently twelve courses are taught in English to also attract foreign (exchange) students. The programmes are imbedded in the international SILVA network. The Director and several lecturers and students take part in SILVA conferences to improve internationalisation.

Strengths and Areas of Improvement

- Several Institutes provide their knowledge and expertise on natural resources into the BSc and MSc programmes;
- The programmes are well connected to resource-management practitioners, and business and policy organisations;
- The programmes are is strongly link with representatives of various employers, who also indicate poorly developed or missing necessary skills;
- Although numerous topics are taught by representatives from different institutes in many different courses, coherence in the programme could well be improved;
- Some of the course descriptions are rather traditional and based on less-timely textbook or educational material. Although, internationally generally accepted concepts, such as ecosystem services and ecosystem accounting, are mentioned, they are mot mainstreamed yet;
- The planning and motivation for the curricula is strongly focussed on the needs for Estonian resources and based on Estonian traditions in resource management. Further developing the curricula requires a more international orientation;
- The scientific research skills of students in the BSc programme could be strengthened by better anchoring the Research methodology module;
- The current action plan (page 58 of the Self-Evaluation report) focuses very much on individual tasks implemented by a responsible person, but not on the development of more integrated programmes; and
- The MSc programme equips the students with scientific and professional knowledge to adequately understand the fate of natural resources and manage them in changing environments.

Recommendations

- Modern E-learning methods are not strongly emphasized in the Self-Evaluation Report and the discussions with the Assessment Panel. Only Moodle platforms to exchange education information are mentioned. Considering such methods could help to better integrate the courses and help the students understanding how the many different topics connect.
- The Director and Curriculum Committee should develop a more future-oriented vision in which environmental change and other timely resource management issues are better addressed. This vision should also help to better integrate the various courses, reduce the fragmentation and inspire staff and students.

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials,

teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Comments

The available resources support the programme's objectives. Most facilities have recently been renovated. The laboratories, for example, were recently renewed and are equipped up to modern standards. The lecture, seminar and practicum rooms are good. A satisfactory supply of textbooks, specimen collections (herbarium, mushrooms and insects), internet facilities (including e-learning) and other teaching aids (e.g. computers, GIS software) are available. The EMÜ students have also access to the libraries of Tartu University. However, the textbooks linked to some of the courses are a little dated (compared internationally).

Strengths and areas for improvement

- There are modern lecture, seminar and computer rooms. The latter are equipped with timely computer hardware, software and access to relevant databases;
- As the programmes are supported and directed by two institutes, there are ample opportunities for thesis subjects and supervision; and
- The research laboratories, especially those for forest pathology, are modern and well-equipped with modern apparatus, but teaching laboratories are lacking or poorly equipped.

Recommendations

- Create better teaching laboratories for the MSc students to better instruct during practicums and group work on forest pathology, dendro-physiology and entomology.

Teaching and learning

Standards
- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.

- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Comments

Most courses combine learning the theory in a class (i.e. lecture) setting with practical training (c. 7% of the total ETCS) at the Järvselja Training and Experimental Forest centre, depending on the topic with a seasonal focus (e.g. game management in the winter). Field trips are also included in several courses. Finally, the MSc students all do an 'internship' in the course "Practise and Research In an Enterprise" which is finalized with a written report on their learning experiences. Assessment of courses is taken seriously and done according to EMÜ's regulations. Academic fraud is addressed. Excellent students can participate in an advanced research project, while the other students select are more applied topic. The final theses are examined by a defence board with internal and external members.

The Study Information System is used to collect student evaluations on lecturers performance, courses and other activities. These evaluations are taken seriously by the lecturers, curriculum heads and the director, and negative comments are generally dealt with immediately.

Strengths and Areas for improvement

- The teaching facilities and approaches are appropriate, and stimulate students to become experienced in both theoretical and practical knowledge;
- Procedures and evaluations protocols are well established and adhered to by staff and students;
- The practical training, field trips and the Enterprise internship provide ample opportunities for the students to get acquainted with realistic professional work conditions; and
- Although the teaching staff is stimulated to develop and use more effective teaching methods, the programmes generally uses traditional approaches.

Recommendations

- The Assessment Panel urges the Programme Director and Curriculum Committee to more strongly and actively stimulate modern teaching methods, including e-learning approaches, and assess their effectiveness.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.

- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Comments

The lectures and other teaching staff stems mainly from the two institutes that support the programmes. The staff is dedicated and experienced, and most of them are experienced researchers with a PhD degree. Although the staff is offered courses to enhance their educational and teaching skills, few have actually taken such opportunity. This limits advances in quality and timeliness, and on the longer-term could well jeopardize the attractiveness of the programmes for both new BSc students and MSc students.

Strengths and Areas for Improvement

- Most teaching staff are also active researchers. This strengthens the link between the science and the teaching, and enhanced the critical reflection skills of especially the MSc students.

Recommendations

- During the annual appraisal interviews staff should be persuaded to participate in educational courses in order to improve the quality and to enable a better use of modern teaching methods. If possible, educational and teaching skills should also be trained for the practitioners, who teach on their experience and should inspire the students.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional

preparation and social competencies.

Comments

The enrolment of students is competitive. The selection processes selects for motivated and eager students. However, the drop-out rates are still high, mainly due to financial reasons. The Assessment Panel was informed by the students that they liked the programme, but that an additional emphasis on public administration and more applied mathematics and statistics would be desirable.

Strengths and Areas for Improvement

- Individual mentoring and teaching is offered to weaker students; and
- Students are motivated and enthusiastic.
- Too few students study abroad;
- Little information on societal relevance, job opportunities etc. from the programme is obtained from alumni.

Recommendations

- Continue to analyse the reasons for students drop out and mitigate it;
- Provision of more effective consultations to students on options for studying in other Estonian Universities and abroad;
- Improvement of alumni network to obtain more regular information on alumni.

2.5. Management of Urban and Industrial Landscapes (Master)

Study programme and study programme development

- ✓ Standards
- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Comments

The Master programme 'Management of Urban and Industrial Landscape' has a specific spatially and problem oriented – and therefore reasonable – profile and provides in-depth knowledge and understanding in environmental policies, environmental management in industry and municipalities, impact assessment of human activity on the environment, restoration of ruined landscapes and industrial areas, and planning of sustainable living environment both at Estonian and international levels (Self-Evaluation Report, p. 119). The content and structure of the study programme are mainly consistent with its objectives and learning outcomes. The goal of the programme, mentioned in Self-Evaluation Report, p. 119, is to provide in depth-knowledge, especially with regard to chemical processes, eco-toxicology (Self-Evaluation Report, p. 121), which is actually not mirrored in the MA-programme. Instead of this, the programme contains a broad range of subjects, which are more or less applied science topics (Environmental Impact Assessment, environmental strategy, fundamentals of entrepreneurship, management practices). Especially the practitioners pointed out that there is a need for a more generalist approach, as implemented in the current programme, to increase job chances of the graduates. Different parts of the study programme form a more or less coherent whole. The launch or development of the study programme is based on legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being strived for. The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Strengths and Areas of Improvement

- Continuous updates of teaching content and incorporation of feedback from students, alumni and professionals;
- High proportion of practical training in the curriculum, theory and practice are well balanced;
- Good opportunities for practical training – several framework cooperation agreements are in place.
- There is a need for improving communication between teachers;
- Too many small courses limiting the potential depth of training in some key subjects.

Recommendations

- The assessment panel suggests to further develop the curriculum towards a more research based education consisting of both fundamental and special applied courses. This should include the development of larger, more coherent courses in order to reduce the fragmented nature of the programme and the establishment of regular roundtable with teachers from other departments to discuss jointly taught courses.

Resources

Standards

✓ Resources (teaching and learning environments, teaching materials,

teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Comments

Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises) support the achievement of objectives in the study programme. Buildings are being modernised. Beside EMÜ library students can use University of Tartu library and other libraries in Estonia; EMÜ also has licences to use different international online databases (Self-Evaluation Report, p. 79). There is a sufficient supply of textbooks and other teaching aids and they are available.

There is a computer lab with 20 computer stations. Specific GIS and CAD software is available in the computer lab and widely used in the process of teaching and research. Other university computer labs are used for teaching as well, e.g. in teaching IDRISI and Erdas Imagine, Statistica etc. (Self-Evaluation Report. P. 79).

Finance resources are limited for student field trips and other fieldwork.

Strengths and areas for improvement

- Premises and infrastructure are in good condition including lecture rooms, studios, computer classes, labs, IT service, software. Another positive finding is that E-learning has become more popular and study material for students is available by Internet and intranet. But, there are financially limited opportunities for student field trips and other fieldwork which can be undertaken.

Recommendations

- Increase of financial resources for improving the department's material basis and student field trip support.

Teaching and learning

Standards
- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support

achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Comments

The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of learning outcomes. Modern teaching methods are used in teaching. Problem/project based learning is applied in several courses: Emergency preparation and crisis management, Quarry restoration and management of industrial and soil spoilt areas, Sustainable environmental engineering II; Environmental management and risk assessment, Environmental impact assessment. In addition to practical training, field trips are used as a teaching method in many courses, for example in Environmental management practices, and Quarry restoration and management of industrial and soil spoilt areas. Several well-known practicing environmental experts participate in the teaching (Self-Evaluation Report, p. 80).

The process of teaching and learning supports learning mobility, at least within Estonia. The Institute of Agriculture and Environmental Sciences has signed several agreements with the ministries, local authorities and companies to support student placement training (Self-Evaluation Report, p. 80).

Assessment of learning outcomes (including recognition of prior learning and work experiences) is transparent and objective.

Strengths and Areas for improvement

- Participation of practicing environmental experts in the teaching process;
- Practical activities support theory in the learning process with ample opportunities for participation in practical training;
- Implementation of novel teaching methods is slow;
- Not all Master's students take part in research projects.

Recommendations

- Further development of electronic study environments (e.g. Moodle). Revision and/or creation of new study materials for the courses in electronic environment (e-learning);
- Regular meetings of the teaching staff of different departments (after each semester) to find out and avoid duplications and shortcomings in courses;
- Organisation of more study tours and field studies, especially including examples on international level;
- Involvement of all Master's students in research projects.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Comments

There is teaching staff with adequate qualifications to achieve the objectives and learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning. Practicing environmental experts are involved in the teaching process. The curriculum of Management of Urban and Industrial Landscape is largely taught by lecturers from three departments: environmental protection, landscape management and nature conservation and landscape architecture, 71% of the lecturers have a PhD degree. Staff members represent Estonia and the Estonian University of Life Sciences in several international environmental and biodiversity-related organisations, ministerial working groups. Publication of research results has intensified over the last years as well (Self-Evaluation Report, p. 81).

Overall student assessment on teaching skills of the teaching staff is positive. Feedback from the Study Information System (ÕIS) is usually followed up directly by the teachers concerned and the head of the curricula, and where there are recurring problems, the leader of the curricula, the head of department and administration of the Institute take action (Self-Evaluation Report, p. 81).

The teaching staff is engaged in professional and teaching-skills development. Lecturers are also all involved in development and/or scientific projects to develop their skills, knowledge and qualifications through attending numerous conferences and training. Fundamental and applied research strongly supports teaching through both the application of research outputs and in funding (Self-Evaluation Report, p. 81).

Strengths and Areas for Improvement

- Academic staff members are highly qualified, active in improving their qualifications, and have a high number of R&D contracts. The age structure is balanced and practitioners and lecturers from other universities are involved in the programme. Nevertheless teaching load is unevenly distributed and there is a lack of competition in the process of electing teaching staff.

Recommendations

- Continuation of involvement of both specialists from other universities and practitioners;
- Lecturers should be more involved in research activities; a better balance of researchers' and teaching staff members' workload should be achieved.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Comments

Student places are filled with motivated and capable students. Dropout rates with 25% caused by financial problems of the students are not extremely high. Specialists from the Academic Affairs Department contact dropout students to help those finding solutions and to bring them back to University (Self-Evaluation Report, p. 82). Very few students study at other Estonian and/or foreign higher education institutions as part of their studies. To recognise the studies in other universities, the APEL system is set up. To go abroad the students are assisted in finding obligatory courses in their curriculum which can be replaced with studies abroad. (Self-Evaluation Report, p. 82). Some students use distance learning (age 25-50), which in consequence lead to less social contacts among the students than in other study programmes. Thus, there are different experiences among the students, who are partly well experienced, professional people when starting the MA programme.

Many students and graduates work in the field of environmental protection. A high percentage of our students and graduates work in the field of environmental issues. They have found jobs in state authorities, other universities or environmental companies as specialists, some have taken up their doctoral studies. However, no survey has been carried out with a direct focus on alumni of

the Curriculum of Management of Urban and Industrial Landscapes (Self-Evaluation Report, p. 82).

Strengths and Areas for Improvement

- There is a high competition in admission in the curriculum;
- Students have a high motivation to study;
- Low (international) mobility of students;
- Feedback from alumni has to be improved.

Recommendations

- More frequent talks with students to motivate for study abroad;
- In the next few years a system of collecting feedback from employers and alumni has to be developed;
- Regular analysis of curriculum feedback.

2.6. Landscape Protection and Preservation (Master)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Comments

The MSc programme Landscape Protection and Preservation was developed after 1995 to educate experts, who were familiar with rural communities and nature conservation. The programme now focusses on biodiversity, landscape preservation, natural resource management, nature conservation and spatial planning, all in the context of environmental change and management. Within Estonia this programme is unique. The programme is directed by Prof. Kalev Sepp, is well-embedded within the Institute of Agricultural and environmental Sciences (Department of Landscape Management and Nature Conservation) and

is effectively connected to ministries and agencies. The programme is governed by the Curriculum Committee. Committee members and teaching staff meet regularly to discuss the curriculum and coordinate courses.

Students obtain the necessary scientific knowledge and understanding, together with series practical skills. Most of them will work after graduation in research institutes and universities, local and national authorities and environmental management companies. Although the students indicated that the courses and practical work covered the essential topics, they found that more (international) excursions and field trips should be organised to get acquainted with real environmental situations. Some teachers and students told the Assessment Panel that the programme was too strongly fragmented by many small courses.

Strengths and Areas of Improvement

- A strong curriculum that has been developed in response to feedback from students and possible employers;
- The programme is well-adjusted to the national standard of higher education and the other programmes in EMÜ;
- Scholarships to students are provided as research assistant. Students depend therefore on the research grants and resources of the Department of Landscape Management and Nature Conservation;
- Practical and research training is well balanced with the theoretical understanding. Ample opportunities for the research thesis are available through collaboration with other institutes and research organisations;
- Although the Curriculum Committee and staff meet regularly, coordination between courses could well be improved; and
- The financial resources are inadequate to increase the number of excursions and filed trips.

Recommendations

- The programme should be developed more coherently. To achieve this, a more integrative vision of the complete field Landscape Protection and Preservation should be discussed and established. This will also help to improve the balance between the basic natural science knowledge and understanding, the scientific research skills and all the practical knowledge and experience.

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Comments

The buildings are recently renovated and the laboratory facilities are new and timely. Scientific collections (plants, mushrooms and fungi, and insects) are available and provide good insights in the (history of) Estonian flora and fauna. Computer rooms are well-equipped with hard- and software and linked to the internet. Students can use GIS, CAD, remote sensing software, geographic databases, and statistical programmes. Field stations are offered for field trips and field work. All students have access to the libraries at EMÜ and the University of Tartu.

Strengths and areas for improvement

- Modern and adequate housing and facilities with up-to-date hard and software; and
- Study materials are now better available (e.g. electronic textbooks), partly through the effective and frequent use of internet; and
- Although field trips are organized at the field stations, limited financial resources do not allow for expanding excursions and field trips.

Recommendations

- Attract more external financial resources (partly from research) to better support the educational finances.

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Comments

The programme consists of lectures, contact classes, seminars, practical training and individual tasks. All courses balance theoretical and practical work (often in field trips). Recently teaching approaches include e-learning, problem-oriented approaches and problem-solving methods. Courses are well documented by the lecturers, including also the assessment approaches. External practitioners teach real-world examples from their own experiences. The course "Practical Training in Landscape management" includes an internship in an enterprise or governmental

organisation. These internships are organised by the students but they are helped by the practical raining supervisor, who also evaluates the internship reports together with the organisation's supervisor. For the final thesis each student selects a topic. Topics are discussed and further developed in the course "Research Methodology" and the final thesis is defended before a committee. Academic fraud is addressed.

The Study Information System provides ample opportunities to inform students and caters for the student evaluations. Lecturers and other teaching staff respond rapidly to student complaints and can help finding solutions when student experience obstacles. The study programme is somewhat flexible to implement individual student solutions. Although only few students have taken the opportunity to study abroad, student mobility is stimulated.

Strengths and Areas for improvement

- The programme stimulates both the theoretical understanding and practical experiences and skills;
- Some of the course descriptions are rather traditional and based on less-timely textbook or educational material. Although, internationally generally accepted concepts, such as ecosystem services and ecosystem accounting, are mentioned, they are mot mainstreamed yet;
- A diversity of research thesis topics, which include state-of-the-art basic natural science research, interdisciplinary research and applied research, and supervisors are available; and
- Although modern teaching methods are stimulated, their implementation seems to be slow.

Recommendations

- All Master students should participate in a research thesis project, so that they obtain enough skills to reflect on the strengths and weakness of research outputs. This is important in their professional career; and
- The Institute and the Curriculum Committee should stimulate and endorse modern teaching methods, without jeopardizing the balance between basic, interdisciplinary and applied research and professional skills. This also involves the continuous training of lecturers and other teaching staff.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher

education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Comments

The programme draws from various experts from different institutes. They are all professional and experienced experts as most have a PhD. PhD students also contribute to teaching. The obvious research skills, which are demonstrated by the many internationally relevant publications, and involvement and including the PhDs enhances the immediate link between research and teaching. Although, the opportunities are not actively used, lecturers and other teaching staff are offered courses to improve their educational skills. The external practitioners that teach real-world examples from their own experiences are also evaluated and replaced if they do not perform well. Some international lecturers have contributed to some of the courses. Student feedback from the Study Information System helps to improve didactic skills. All staff responsible for courses and other activities will use the criticism from the evaluations to discuss them with the involved teachers.

Strengths and Areas for Improvement

- The staff is highly qualified and brings academic research into teaching;
- Lecturers and teachers have much freedom to develop their courses. The Curriculum Committee defines the structure and objective but within these boundaries the teacher can select education methods, topics and lecturers;
- Few opportunities exist for lecturers to attend education conferences. This could limit pedagogical developments and international exchange of teaching methods and ideas;
- The international lecturers provide additional and necessary insights from international examples to the students, and stimulate teaching in English; and
- Students' feedback and problems are taken seriously.

Recommendations

- As modern teaching methods are envisioned to become more important, staff should be more strongly be trained in developing those methods and implementing them;
- As most lecturers are active researchers, the balance between research and teaching could become an issue; and

- The emphasis to invite experienced senior lecturers from abroad is excellent. This should be done on a more structural basis and financial resources should be freed to stimulate this.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Comments

The admission of students is competitive as they should have the best skills and qualifications from a bachelor degree or professional higher education curriculum. Fifteen students start every year but only 80% graduate in the end. Drop-out rate is relatively high because of financial constraints for students to complete their studies. The Academic Affairs department helps to reduce drop-out rates. Student are tutored and can get support through the Student Council.

The Landscape Protection and Preservation students have also organised themselves in the Environmental Protection Students' Association (EPSA) of EMÜ since 2001 to improve professional skills, promote sustainability, organise social events, student exchanges (e.g. with Lille in France) and summer and winter 'Academies' and link to similar groups in Estonia and abroad.

Students are stimulated to study a semester of year abroad through, for example, Erasmus exchange programmes.

Strengths and Areas for Improvement

- The international (research) connections of staff and education exchange opportunities provide the possibilities for students to broaden their horizon;
- Students have ample options to provide feedback to courses and lecturers through the Student Information System, EPSA and through direct contact with lecturers; and
- Students collaborate with renowned researchers, who focus on basic research, interdisciplinary research or applied research. This enhances thesis opportunities and guarantees better research supervision during doing the thesis research.

Recommendations

- The relatively high drop-out rates should be reduced by encouraging students to graduate. Appointments as research assistants in research projects could maybe help. Additionally, involving alumni to illustrate the better job opportunities after graduate could also have a positive influence; and
- Internationalisation is successfully pioneered by this programme and will be enhanced in the near future. More emphasis should be laid to stimulate more staff members to participate in international projects (e.g. Horizon2020), inviting more internationally renowned lecturers and better stimulate students to participate in exchange programmes.

3. Assessment report of Life Sciences SPG at University of Tartu

The aim of this external report is to further deepen into the analysis, strengths and weakness of the present Bachelor and Master Biology study programmes of the University of Tartu found in the self-assessment report, and provide an external view to support the managers of the programmes to improve the Bachelor and Master Biology degrees.

The self-assessment report of the University of Tartu Life Sciences study programmes is very informative. In most cases it is not only an analysis of the current situation but it goes further to elucidate the specific areas where there is room for improvement. While information to support the assumptions is not always fully available, the analysis reveals the deep involvement and knowledge the managers have about the programmes. It is worth mentioning that the merging of the Biology and EBC Bachelor programmes (to be started in the 2016 academic year), is where the improvements are expected to be implemented.

3.1. Biology (Bachelor/Master)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Comments

The managers of the programmes have been active in implementing measures to improve the Bachelor and Master Study programmes, which were consequently modified during 2012-15. As a final result, a novel Bachelor curriculum including

together the present degrees of Biology, and Ecology and Biodiversity Conservation (EBC) is ready to start in 2016-17. In the Master study programme there have been only minor changes.

The Objective of the Bachelor in Biology (p75) is to provide general education in Biology that enables a graduate to continue studying a Master degree. Labour market objectives are not formulated. Learning outcomes are centred in knowledge, understanding and use of Biology. The curriculum (p 77-79) is organized in modules composed mainly of short courses (2 to 4 ECTS) that demand a strong organization effort to build schedules and structure knowledge. No specialization is provided apart from the 12 ECTS of electives chosen by the students as far as they do not overlap. The Bachelor Thesis may be only based in literature. While the curriculum is mostly sound and complete, the objectives and the development of integrative knowledge require to be better structured and explained.

For the Master Biology curriculum (p81-86) no specific objective is provided but learning outcomes are adequate for the Master level of education. The curriculum provides specialization through the 60 ECTS obligatory module in one of the three specialties, where students have an offer of ca. 2 ECTS per ECTS to select; courses are mostly 3ECTS. For the 24 ECTS Master Thesis subjects there are 4 choices in one specialty and only one for each of the other two specialties. Overall, considering the low number of students, the demand for the courses is to be low.

Following a recommendation from the University of Tartu action plan, the Life Sciences programmes have been successfully marketed into the society, but the Biology curricula have not been marketed (p54). Most measures to improve the Biology Master programme are waiting for the new Bachelor Biology plus EBC graduates to enrol in the master.

The University of Tartu establishes that all decision-making and advisory bodies of the University must include student representatives (p24). Each programme has a programme council and a committee that organizes taking feedback from the students every three years; the information on the previous courses opinion is used to review and improve the programmes and it is available for students at ISI. All timetables are also available on the ISI before the end of the previous semester.

Practical training should receive more consideration in the Biology Bachelor programme. The offerings of internship in the last three years (p32) have increased but they are still insufficient. The Master elective course "Enterprise Training" offers very few positions to develop part of the student academic formation in or outside the University. One of the alleged constraints of the practical training internships is that companies are not usually in Tartu or nearby. The new Bachelor Biology plus EBC curriculum starting in 2016 makes some improvements in practices, practical training and field courses.

Lecturers are given a lot of freedom to produce syllabi; as a result, the information is not provided in a simple and homogeneous format that facilitates a

general understanding of the development of the courses along the academic year. Structuring the descriptions in a more homogeneous, concise and clear format will facilitate work organization to the students.

Students are usually aware of learning outcomes for the specific subjects but not for the general ones of the degree. It is frequently difficult to acknowledge how a given course contributes to the general learning outcomes (compare p76+80 with p88-106). Also, most courses are said to address all or most learning outcomes of the Standard Higher Education (p112-117). However, how a given course contributes to every one of these general learning outcomes has not been analysed. A detailed clarification on the contribution of every course to the programme learning outcomes is required to get precise knowledge of the achievement of the general outcomes.

The self-assessment report shows an example for the Biology Bachelor study programme, while the complexity of the elective courses in the Master results in a unique individual study plan for every student and no example can be provided. In this line, students of the Life Sciences degrees have complained about the timetable development (p 32). Students are the facto asked to produce their own career plan before starting.

Strengths

- The programme managers continuously monitor the programmes and change courses and/or lecturers not providing the expected results
- Feedback from students is collected every three years and their opinion is used to improve the programmes. It is also public for students
- A new Bachelor joint programme in Biology and EBC will start in 2016-17, resulting from the analysis of the previous years' Bachelor
- Master students may choose among three specialities
- The Master elective course "Enterprise practice" will be also offered to the new joint Bachelor in Biology and EBC
- All timetables are to be available two months before the end of the previous semester

Areas of Improvement

- The Objectives of the Bachelor in Biology are not labour directed
- In the Master study programme there have been minor changes. Now the programme is in a stand-by situation waiting for the joint Biology plus EBC Bachelor new graduates.
- The Bachelor and Master programmes are mainly composed of short courses, 2-4 ECTS, which makes organization and integrative knowledge complex to develop
- The Biology curricula have not been marketed

- Syllabi are not provided in a simple and homogeneous format; they do not routinely incorporate general understanding and details of the development of the courses along the academic year.
- The complexity of the Master results in a unique individual study plan for every student. Students find difficult to organize themselves. Not all courses are taught every year

Recommendations

- Widen the objectives for the Bachelor degree, not only increase knowledge and prepare for a Master
- Market the Biology Bachelor and Master curricula
- Improve the structuring and integrative knowledge of the degrees by providing longer courses (6 ECTS) instead of short ones (1-4 ECTS)
- Ensure enough practical training and/or field courses are available to all students, both of Bachelor and Master
- Promote experimental work for the Bachelor Thesis
- Provide homogeneous syllabi for all courses, incorporating all information in a simple way to facilitate work organization to the students
- Simplify and facilitate the organization of the courses of the Biology Master students, including timetable improvements

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Comments

The programmes are taught in two nearby buildings, which are well equipped. They are also conveniently located near the city and the students' residence halls. General resources are considered good or very good both by professors and by Bachelor and Master students, although there are occasional shortages of

specific equipment. For the graduation Thesis, and under the guidance of the supervisor, students may work in fully equipped research laboratories (p41) of their choice.

Moodle has been implemented as e-learning environment, but it is irregularly used among the courses. Regarding materials for study, books are easily available and most professors provide materials and instructions through ISI. Powerpoint presentations are frequently fully informative. While this may be overall convenient, it is also acknowledged that a significant number of students may abandon the attendance to the lectures and rely exclusively in the presentations to learn.

On the other hand, the international dimension of the degrees has not been developed. The website informs that if there are foreign students, most lecturers will teach in English. However, it is totally unclear how this may occur and prospective foreign students risk to be taught only in Estonian; consequently, there are no foreign students learning in English. Also, the participation of Bachelor and Master students in Erasmus activities outside Tartu University and Estonia is not facilitated.

Strengths

- The studies mainly take place in two nearby buildings. They are also close to the students residence halls and to Tartu city
- Overall, resources for the study programmes are good or very good
- The scientific research infrastructure is very good and students may work in fully equipped research laboratories
- Study materials and instruction materials for the practicals are provided by most professors and are easily available for students

Areas of Improvement

- There are occasional shortages of specific equipment, e.g. binoculars
- The budget for practicums is insufficient to cover all the expenses; related research projects contribute also to cover them
- Moodle is available but irregularly used
- Detailed powerpoint presentations make it easier for the students not to attend the lessons
- The international dimension of the degrees has not been developed

Recommendations

- Revise the needs for specific experimental teaching equipment, including practicums
- Promote the use of Moodle as e-learning environment

- Review the materials provided so that they do not contribute to students not attending lessons essentially based in providing information
- Attract foreign students through a specific set of courses and/or activities offered in English
- Develop the resources to promote and facilitate participation of Bachelor and Master students in Erasmus activities outside Tartu University and Estonia

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Comments

Problems identified by the students are discussed with the corresponding professors and they are reasonably satisfied with their learning process and outcomes especially from the scientific point of view more than that from the professional one, but the oral and social skills activities are very limited. Overall, they have not been conveniently developed in the courses, especially for the Bachelor students, and do not include English use; nevertheless, interviews with students reveal their ability to communicate in English is excellent.

While the programme managers have been active in solving specific problems of individual courses, changing the structure of a course or even replacing the lecturers, the general limitation in developing the oral and social skills, especially for the Bachelor students, has not been properly addressed. The programmes promote the reduction of traditional teaching in favour of increasing other

learning activities (p 45), but their extent in the specific courses remains unknown and irregular among the courses, and it is globally low. The students are clear stating that this shift in the way of teaching has not yet been widely implemented and there is still room for improvement. They consider that these activities are mostly developed as a routine, without a real involvement of the teachers and students in further interaction through discussions. While all Master Thesis are based in experimental work and some of them may result in publications in scientific journals (p46), still several Bachelor Theses are based only in literature (p45). Attending lessons is not compulsory and up to 50% of the students may prefer own study of the fully informative powerpoint presentations.

For the Master programme previous studies may be recognized, provided they are not part of previously defended degrees (p44). Working experience may also be recognized as practical training (p42). Lecturers participate in the process and the recognition process is transparent and objective. On the other hand, as mentioned in the programme development section, flexibility in the Master in Biology results in students designing their own individual curriculum, which leads to complexity in organizing their schedules and may have consequences in the student satisfaction. This complexity may also increase dropouts and extended periods to finish the degree.

Dropout rates are high and graduation on time rates is low for both programmes, especially for the Bachelor. This shows some imbalance in the teaching and learning process that requires to be addressed. As mentioned above, some efforts have already been taken to increase a number of activities that facilitate the teaching and learning process in specific subjects. Every individual course is expected to incorporate several teaching methods and to provide detailed information in the description of the course about the share of every sort of activity, both in time and in percentage over the final marks. The information regarding the implementation of these activities is to be made public or at least the students need to know it to decide whether or not to enrol in the courses.

Strengths

- Problems identified by the students are discussed with the corresponding professors
- Students are reasonably satisfied with their learning process and outcome, especially from the scientific point of view
- The programme managers are active in solving specific problems of individual courses, changing the structure of the course or even replacing the lecturers
- There is a transparent process of recognizing previous studies and working experience
- All Master Thesis are based in experimental work and some may result in publications in scientific journals

Areas of Improvement

- The oral and social skills of the students are not conveniently developed, especially in the Biology Bachelor degree
- The flexibility in the Master in Biology is excessive and leads students to the complex process of designing their own basically individual curriculum
- The extent of diverse teaching activities in the specific courses remains unknown in the individual courses and it is globally low.
- Some Bachelor Thesis are based in literature
- Dropout rates are high and graduation on time rates are low for both programmes, a number of them due to poor study results

Recommendations

- Work to better prepare the Bachelor graduates in Biology to either attend a Master or to enter into the labour market
- Introduce new participative and more challenging activities in all or most courses, especially to educate in oral and social skills.
- Promote Bachelor Thesis based in experimental work
- Address the high dropouts and the low graduation on time. Increase activities that facilitate the teaching and learning process for every course.
- Provide detailed information in the description of the courses about the share of every sort of activity, both in time and in percentage over the final marks.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.

- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Comments

The teaching staff has the required qualifications to achieve the objectives and learning outcomes of the Biology Bachelor and Master study programmes and is deeply involved in research. In spite of this, the continuous review of the teaching quality has revealed that further improvements are required. There is a wide range of effectiveness in communicating the knowledge by the lectures: while some lecturers communicate in a very attractive way, in other cases the lessons are received as a dull summary of information. The teaching and learning process may occasionally suffer limitations in the time the teachers take to give the results of the exams and to correct assigned tasks.

There is also a certain issue with the involvement of PhD students in the teaching process: their teaching skills are poorly developed, but they require teaching experience in their curriculum (p51). Some teachers developing insufficient teaching abilities have been also replaced. However, replacement may not be the only choice; training PhD students on teaching skills may benefit both the teachers and the students. There is a pedagogical skills course to train PhD students, but the number of positions is very limited and no other seminars or courses are provided for lecturers. Both young and senior lecturers may benefit from the availability of continuous education activities to improve teaching (e.g. efficient use of new teaching methods, Moodle use, etc.). All teachers should be encouraged to communicate effectively and also be valued for teaching.

The Biology Bachelor and Master programmes have only occasionally incorporated teachers or researchers from other countries as supervisors of individual student work, but courses are taught in Estonian language. There is a limited participation of teachers from other Estonian institutions in the programmes. In practice, this results in a very weak internationalization of the Biology Bachelor and Master programmes. Meanwhile, it is absolutely contradictory that fairly everybody may use English very efficiently.

Strengths

- The teaching staff has the required qualifications to achieve the objectives and learning outcomes of the Biology Bachelor and Master study programmes
- The teaching process is routinely analysed and when required teachers may be replaced. The process is transparent and the results are public

Areas for improvement

- The teachers may delay giving the results of the exams and the correction of assigned tasks

- The effectiveness in communicating the knowledge by the lectures is sometimes low
- The teaching skills of PhD students involved in the teaching process are frequently low
- No specific seminars or courses are available to all lecturers, either young or senior, to improve teaching
- The participation of teachers from other countries or other Estonian institutions in the programmes is limited

Recommendations

- Establish deadlines to give the results of the exams and to correct assigned tasks
- Train all PhD students on teaching skills. Organize specific seminars or courses to assist young and senior teachers in developing new teaching skills
- Increase the participation of external teachers and researchers, both Estonian and foreigners, in the programmes

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Comments

Tartu University is considered the leading University in Estonia, especially for science. However, demand for the Biology Bachelor and Master programmes has substantially decreased and is now well under the number of positions offered; 50% and 33% empty, respectively, in 2014. The deficiency of the programmes to attract students is said to be associated to demographic reasons; however, other

programmes have remained attractive for students (e.g. Gene Technology). The managers also believe that there is an excessive number of Biology Bachelor and Master degrees offered in Estonia (p54). The trend is expected to continue and proactive measures are required. For example, promoting the Bachelor degree among the secondary students, deserves to be considered. In order to adapt the initial student expectations to the real study programme, specific activities have been organized at the beginning of the degree studies.

International mobility is not facilitated for the students and the Erasmus programme has received poor consideration within the degrees. The number of institutions they may attend is very limited. Moreover, students believe that developing mobility is a heavy obstacle to graduate on time (p62) and some students opt for an extra-curricular mobility period. Both graduation in nominal time and mobility are to be improved. Other potential limitations to graduate on time are also to be analysed (p63), among them student attendance and schedule limitations in lectures, practices and exams (p65). Now, first year students are given an early session to help them to better organize themselves and it is reported that the schedule organization has substantially improved in the novel Bachelor curriculum. Students are also unsatisfied with the registration for the field courses and with the lack of time in the third year to write the final Thesis.

The employment rate specific for the Biology Bachelor and Master graduates has been analysed together with that of the other Life Sciences degrees and it is satisfactory, although most Bachelor graduates continue studying a Master and a significant number of Master graduates continue with a PhD degree. Also, there is no follow up of the employability of the Biology graduates. Employees report that their main dissatisfaction is the lack of earlier working experience of the graduates.

Strengths

- To enrol in the Biology Bachelor and Master programmes, the potential students may get information through the University of Tartu website
- A Bachelor course provides insight into the working possibilities in the Biology field
- An employment rate survey of the Life Sciences degrees indicates it is over 70%

Areas of Improvement

- Demand for the Bachelor and Master of Biology has substantially decreased and is well under the number of positions offered
- The percentage of Bachelor students graduating on nominal time is low
- Mobility is very low

- The students report dissatisfaction with registration for the field courses and with the lack of time to write the final Thesis
- There is no follow up of the employability of the Biology graduates

Recommendations

- Organize activities to promote the Bachelor and Master in Biology study programmes
- Analyse the real causes of dropouts and establish measures to diminish them
- Clarify the main causes for late graduation, especially schedule limitations in lectures, practices and exams, registration in field courses, mobility and time to work for the final Thesis and adapt the programmes as required
- Strengthen the Erasmus programme within the degrees, promote mobility
- Give clear directions to facilitate the recognition of mobility activities for the curricula

3.2. Ecology and Biodiversity Conservation (Bachelor/Master)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Comments

The BSc programme Ecology and Biodiversity conservation started in 2002 to educate experts with enhanced knowledge about ecology and diversity

conservation to work in nature protection institutes and nature protection areas. The programme is since 2010 directed by Prof. Maris Hindrikson. Curriculum Committee members and teaching staff meet regularly to discuss the curriculum and coordinate courses. Some teachers and students told the Assessment Panel that the programme was too fragmented by all the many small courses.

Learning outcomes are well defined at the curriculum and individual course levels, achieved through a balanced set of obligatory and selective courses, and assessed and evaluated though the exams of individuals courses and more integratively in the SIS evaluations. Every three years the programme director has to report on how the results of these evaluations have been used in the further curriculum development. Evidence in the Self-evaluation report and during the various discussions with the Assessment Panels shows that the evaluations are taken very seriously and have resulted over the years in improvements of the overall curriculum.

Students obtain the necessary scientific knowledge and understanding, together with series practical skills. Most of them will work after graduation in research institutes and universities, with local and national authorities and various nature conservation organisations.

Strengths and Areas of Improvement

- Strong and broad bachelor and master curricula that has been developed in response to feedback from students, and that caters for professional nature conservation experts and specialists ;
- Practical and research training is well balanced with the theoretical understanding;
- To include real research in both bachelor and master thesis is strongly stimulated. Supervisions can be provided by lecturers that are experienced in research; and
- Although the Curriculum Committee and staff meet regularly, coordination between courses could be improved.

Recommendations

- The current curriculum consists of many short (i.e. 3 ETCS) courses. A more coherent programme should be developed. To achieve this, a more integrative vision of the complete field Ecology and Biodiversity Conservation should be discussed and established, if possible in collaborations with potential employers and in response to their specific needs. Such vision could help to better structure the curriculum and specialisations by, for example, merging and expanding courses; and
- The curriculum strongly focusses on Estonian nature conservation. As much of the relevant legislation (e.g. Natura2000 and the habitat directive) is now defined by the EU and much can be learned from successful nature conservation and restoration efforts abroad (including research), internationalizing the curriculum would be an advantage;

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Comments

The buildings are appropriate and the facilities are very good. Laboratories, libraries and working rooms are available to the students, even after working hours because of an excellent security and pass system in the different buildings. Laboratories are well equipped to accomplish basic analyses (e.g. water and soil, or microscopy) and advanced instruments are available for the more state-of-the-art and innovative analyses. Computer rooms are well-equipped with hard- and software and linked to the internet. Students can use GIS, CAD, remote sensing software, geographic databases, and statistical programmes. All students have access to the libraries at the University of Tartu, in necessary at other universities.

Strengths and areas for improvement

- Modern and adequate housing and facilities with up-to-date hard and software; and
- Study materials are now better available (e.g. electronic textbooks), partly through the effective and frequent use of internet.

Recommendations

- The availability and use of resources and facilities are unique. The Assessment Panel was impressed by the amount of thrust that was given to students to (independently) use the facilities. This can only be done when they are properly trained and experienced in using the equipment. Also students take their responsibilities in, for example, cleaning up after completing their analyses.
- The Assessment Panel learned that financial resources were limited for practical work and field trips. Lecturers and the Curriculum Director should more successfully apply for funds and maybe link to enterprises, who will later employ the students.

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Comments

The programme consists of lectures, contact classes, seminars, practical training and individual tasks. When a student graduates (s)he has a basic knowledge in basic mathematics, physics and chemistry, and the fundamentals of biology and ecology, can identify species and their habitats in relation to biodiversity, is familiar with relevant scientific research methods and is knowledgeable about nature conservation practises in the context of biodiversity and ecosystems, legislations and other social and economic issues. (S)he can collect relevant information and data, analyse and critically reflect on the outcomes to help solving conservation problems in especially Estonia. S)he can participate in the relevant (policy discussion and contribute with an integrated view on scientific, conservation, social and ethical aspects. These learning outcomes are well trained during the curriculum.

Bachelor students are initially taught the basics of natural sciences, including not only the more ecosystem and landscape oriented topics such as biogeography, biochemistry, hydrology, soil science, and ecology, but also the more organismal biological topics, such as plant physiology, microbiology zoology, genetics and evolution. The specialisation modules all start with ecology and biodiversity conservation expanded by selective modules with field courses on flora, fauna and fungi, GIS, microbiology and biotechnology, environmental and social impacts assessment, environmental technology and economics, law and administration. English language and writing skills are also trained. The bachelor study is finalized with a thesis (12 ETCS) which always involve literature research and often also real field work or laboratory research. Most of those topics are

given in relatively short courses of 3 ECTS. This provides ample opportunities for students to select courses, but also could lead to an undesirable fragmentation.

The Master curriculum builds well on that of the bachelor, although graduates with an appropriate background from other programmes in Tartu University and other universities are admitted. When students graduate as master they are specialists in ecology and nature and biodiversity conservation, who show initiative and can work independently and responsibly. Three specialties on aquatic ecology, terrestrial ecology and biodiversity conservation can be selected. The study is concluded with a (research) master thesis of 30 ETCS.

All courses balance theoretical and practical work (e.g. field trips). Recently teaching approaches include e-learning methods but these are not frequently applied. Courses are documented by the lecturers, including also the assessment approaches. However, the Assessment Panel found the documentation of individual courses as provided in the self-evaluation guide a little fragmented and incomplete.

The Study Information System (SIS) provides ample opportunities to inform students and caters for the student evaluations. Lecturers and other teaching staff respond rapidly to student complaints and can help finding solutions when student experience obstacles. The study programme is somewhat flexible to implement individual student solutions. Although only few students have taken the opportunity to study abroad, student mobility is stimulated.

Strengths and Areas for improvement

- The study programme stimulates both the theoretical understanding and practical experiences and skills; and
- The documentation of courses should be improved and completed.

Recommendations

- Both bachelor and master students should participate in a (research) thesis project, so that they obtain enough skills to reflect on the strengths and weakness of research outputs. This is important in their future professional conservation career; and
- The Curriculum Committee should better stimulate and endorse modern teaching methods (e.g. MOOCs and other e-learning, problem-oriented approaches and problem-solving methods), without jeopardizing the balance between basic, interdisciplinary and applied research and professional skills. This also involves the continuous training of lecturers and other teaching staff in using and developing such methods.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the

objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.

- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Comments

The programme draws from various experts from different departments. They are all professional and experienced researchers as most have a PhD. PhD students also contribute to teaching. The obvious research skills, which are demonstrated by the many internationally relevant publications, and involvement and including the PhDs enhances the immediate link between research and teaching.

Although, the opportunities are not actively used, lecturers and other teaching staff are offered courses to improve their educational skills. Some international lecturers have contributed to courses. Student feedback from SIS helps to improve didactic skills. All staff responsible for courses and other activities, uses the criticism from the evaluations to discuss them with the involved teachers. Every three years the Curriculum Director reports on how the evaluations were used to improve teaching and the courses.

Strengths and Areas for Improvement

- The staff is highly qualified and brings academic research into teaching;
- Lecturers and teachers have much freedom to develop their courses. The Curriculum Committee defines the structure and objective but within these boundaries the teacher can select education methods, topics and lecturers;
- Few opportunities exist for lecturers to attend education conferences. This could limit pedagogical developments and international exchange of teaching methods and ideas;

- The international lecturers provide additional and necessary insights from international examples to the students, and stimulate teaching in English; and
- Students' feedback and problems are taken seriously.

Recommendations

- As modern teaching methods are envisioned to become more important, staff should be more strongly be trained in developing those methods and implementing them;
- As most lecturers are active researchers, the balance between research and teaching could become an issue; and
- The emphasis to invite experienced senior lecturers from abroad is excellent. This should be done on a more structural basis and financial resources should be freed to stimulate this.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Comments

Although the admission of students is competitive, not all student positions are currently filled. Master students should have adequate academic competences in nature conservation and biodiversity before they can start the MSc curriculum. If they have not done the bachelor Ecology and Biodiversity Conservation, courses are offered to cope with their deficiencies.

Students are stimulated to study a semester of year abroad through, for example, Erasmus exchange programmes. Student mobility is increasing.

Strengths and Areas for Improvement

- The international (research) connections of staff and education exchange opportunities provide the possibilities for students to broaden their horizon; and
- Students have ample options to provide feedback to courses and lecturers through the Student Information System (SIS) and through direct contact with lecturers.

Recommendations

- To use all the possible student positions in the programme, the programme should be better marketed and introduced to potential students;
- The relatively high drop-out rates should be reduced by encouraging students to graduate. As drop-out rates are high because of financial constrains for individual students, opportunities for scholarship in the form of, for example, appointments as research assistants in ongoing research projects, should be established; and
- Internationalisation is pioneered by the university and this curriculum and will be enhanced in the near future. More emphasis should be laid on developing participation in international projects (e.g. Horizon2020), inviting internationally renowned lecturers and stimulate students to participate in exchange programmes.

3.3. Gene Technology (Bachelor/Master); Biomedicine (Master)

All three study programmes are hosted by the Institute of Cell and Molecular Biology I(CMB) in the Faculty of Science and Technology, and are discussed here together because of their shared theoretical foundation, largely common targets in job market and similar motivational drive and esteem provided by the high level of research in the University of Tartu in molecular and cellular biosciences. They also face similar challenges in the future in shifting the teaching processes more towards student- and learning-centred activities and in finding an optimal balance of training students for academic research career vs. meeting the more varied needs of the wider job markets.

The following analysis is based on the information in the self-evaluation report (SER) of the Study Programme Group Life Sciences and on the meetings the expert panel had with the University administration, Dean and Directors of Institutes and of the study programmes, and with the teachers, present and former students and employers. The critical and insightful report and the meetings give a picture of well-organized programmes with clear agendas and plans for future development. It is hoped that the following comments and

suggestions by the panel will help the programmes to further develop their activities by complementing the self-analysis with some new insights and ideas from an outsider´s point of view.

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Comments

The Bachelor´s (*Bakalaureus*) programme in Gene Technology (GT) (180 ECTS, three years) provides a broad physico-chemical and cell and molecular biological knowledge base which is suitable for subsequent Master´s level studies in Gene Technology and related fields. The courses are relatively evenly distributed between the semesters (26-34 ECTS/semester) and include both theoretical (lectures) and practical (laboratory work). Suitable for a Bachelor´s level programme, the field of modern biology is covered in a broad manner in the form a number of short courses (3 ECTS each) in topics like ecology, evolutionary biology, plant physiology, virology, and immunology. Basic subjects central to gene technology/molecular biology education like biochemistry, genetics, and microbiology receive a more extensive treatment. In general, the curriculum appears balanced and covers relevant topics and is consistent with the presented learning outcomes. Of note, the first-year studies have a quite thin content of the key biological topics and no laboratory courses. This arrangement may not be optimal for keeping up the motivation of the new students entering the programme.

Gene Technology and Biomedicine Master´s (*Magister*) degree programmes (120 ECTS, 2 years) are both molecular biology-based programmes which aim at training professionals mainly for research and development in biotechnology enterprises, biomedical sector and academic research, and at providing

competence for subsequent doctoral studies. The content and objectives of the GT Master´s programme compare well with molecular biology programmes in many other European Universities. A slight discrepancy exists between the curriculum and the title of the GT programmes as there is no particularly strong emphasis on gene technology as such. This should be taken more as a remark than criticism, and - as the panel learned during its site visit - the name has been established because of historical reasons and serves well in attracting students. The Master´s programme in Biomedicine seems to largely overlap with the corresponding GT programme, and although it includes courses relevant to human biology and diseases, a distinctive "biomedical" profile is not presently clear. For example, important topics like pharmacology, laboratory medicine/clinical chemistry, and cancer biology are missing. The self-evaluation report openly acknowledges these problems and hints at current plans, discussed briefly during the site visit, to incorporate much more biomedical content in the program in collaboration with the Faculty of Medicine. The expert panel strongly supports these plans, which will give the programme a profile (and with it, job market competencies) clearly distinct from GT.

In the Master´s programmes, lecture courses are supplemented by practical laboratory courses to give the students hands-on experience in these method-centred subjects. In addition, an enterprise practice combined with an entrepreneurship course is offered as an option in the GT programme. This kind of practise would be highly beneficial for future employment in biotech industry, but the number of places available is limited and – according to a student´s comment – the few places go within minutes after having been announced. As discussed above, the Biomedicine and GT programmes have an extensive overlap in their course contents, and only a few courses are exclusively offered in only one of the programmes. These include courses in yeast genetics and plant physiology in the GT programme, and courses in human histology, neurophysiology, and drug design in the Biomedicine programme. Apart from the overlap, a conspicuous feature of the course palettes is that they contain mostly small, 3 ECTS courses. This gives the curricula a somewhat fragmentary look, which may not promote a wider integration of the subjects by the students. This problem was acknowledged by the teaching staff and was also reflected in discussions with the students. It is likely that constructing larger courses would help to build connections between the (only apparently) separate topics and thereby facilitate more profound learning.

Estonian language is used exclusively as teaching language in the programmes. This is understandable at the level of Bachelor´s studies, but may become too restrictive at Master´s level studies. After all, the science as well as the job market in molecular biology are international with English as the accepted *lingua franca*. The adaptation of English as a (second) teaching language in the Master´s level study programme would also help attract foreign students, now lacking in Gene Technology and Biomedicine programmes.

All three programmes include a final thesis, which involves experimental work performed in most cases within the research laboratories of the Institute of Cell and Molecular Biology or in the associated institutes. This guarantees a high

scientific level and helps integrate the studies with the latest research in the field. Internationally visible science probably serves as the main motivator for the students in these programmes. As a result of this, the curricula have largely developed around the research and are at their strongest in topics, which are represented by top-class science. This provides excellent possibilities to integrate students to research early on in their studies but carries the potential danger of neglecting development of skills and competencies needed in the wider job market which may differ from those nurtured in research-oriented training. Discussions with employers, alumni and students also suggest that slight adjustments to the focus of teaching to incorporate more generic skills relevant for job markets (e.g., group work, presentation, leadership etc.) would be beneficial.

The study programmes appear to be managed in a professional manner. The curricula are developed by programme directors, with the assistance of programme councils, which include representatives of students and employers in addition to staff members. The programme councils set goals, advise the programme directors, and evaluate the performance of the programmes. One indication of the level of administrative professionalism was the well-written self-evaluation report which described the structures and expected learning outcomes of the programmes in clear and informative manner and was quite open in identifying relevant problems in the current situation and in providing a well-thought action plan which aims at correcting them.

An essential tool in programme development is student feedback. Systematic collection of student feedback and procedures for its analysis have been recently established at the University level. Overall feedback is collected from first-year students and from student finishing their degrees and course-specific feedback is obtained after each semester. In an 11-point feedback form, the students are asked to numerically assess the quality and performance of different aspects of the courses, and in addition to the numerical evaluation, there is space for written comments. Response rate is kept at a high level by linking the feedback on passed courses to the registration to new ones. The numerical data is made publicly available and should allow monitoring of annual changes and to pinpoint possible problems. Based on the discussions the expert panel had with the students and staff, the feedback is taken seriously and is regularly analysed and discussed at programme council, departmental, institute and faculty levels. As a result of feedback, some courses have been reorganized and lecturers have been changed. Feedback is also linked as one element to internal evaluations of curricula taking place every three years.

In conclusion, notwithstanding the above criticisms, the curricula appear relevant, and the courses and the practical work together the Bachelor´s Thesis or Master´s Theses form coherent wholes, which support achievement of the learning outcomes. In addition, the curricula comply to the legislation and standards expected nationally and internationally from University-level education.

Strengths

- Bachelor´s and Master´s programmes in Gene Technology are well-established study programmes comparing well with similar programmes in other countries
- The Gene Technology and Biomedicine programmes are popular and have managed to fill the student positions in spite of decreasing number of high-school graduates
- Master´s programme in Biomedicine needs to develop its profile to better distinguish itself from the corresponding Gene Technology programme
- High-level internationally recognized science in the University of Tartu helps attract good students and facilitates integration of students in active research
- The programmes are administered in a professional manner, reflected also in the open and insightful self-analysis
- The system for collecting and analysing student feedback appears effective and comprehensive

Areas of Improvement

- The Master´s programmes have a large number of small courses giving the curricula a fragmentary character
- (Near-)exclusive use Estonian as the teaching language hinders internationalization of the Master´s programmes, including admission/exchange visits of foreign students
- The curricula give excellent competencies for future employment in academic research, but there is room for further development of skills needed in the wider job market

Recommendations

- The content of bio medically relevant subjects should be increased in the Master´s programme in Biomedicine in collaboration with the Faculty of Medicine
- Revision of the fragmented course structure in the Master´s programmes to larger, more integrative courses should be considered
- Teaching in English should be strongly increased
- The Master´s programmes should explore possibilities to incorporate more skills relevant to the job market outside University and research institutes in the teaching

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Comments

ICBM, which has the main responsibility in all three programmes is housed in fairly new facilities equipped with up-to-date research infrastructure and adequate room for various teaching/learning activities. This provides a stimulating, research-oriented environment for the students and helps attracting prospective students to the Bachelor´s and Master´s level and doctoral studies. According to surveys, the students are generally quite satisfied with the resources.

E-learning environment (Moodle) is widely and actively used as a support for teaching and learning. In addition, the students have access to on-line databases of scientific literature. Course descriptions in the SER do not mention possible course literature, and it is not clear whether and to what extent international (English language) textbooks/e-books are used in teaching.

Laboratory courses and projects form an important part of studies at both Bachelor´s and Master´s level, and develop skills which are important for future employment of the graduates. The experimental work in the theses is integrated as part of on-going active research and the associated costs are covered by the research groups. There are no special funds to for student projects, which causes financial difficulties for a the laboratory work which takes place in courses and practises and is not directly linked to research projects. This has led to situations where research money has to be channelled to chemicals and materials used in basic teaching, which is against the intended purpose and also subjects teaching to fluctuations in research funding.

Strengths

- Excellent, up-to-date laboratories and seminar/lecture rooms and computer classes
- Good library services including access by students to literature databases
- E-learning is actively used

Areas for improvement

- Funding for basic laboratory courses and student projects is insufficient/lacking
- Course descriptions do not generally indicate the (recommended) textbooks

Recommendations

- Specific funding should be arranged for the laboratory courses in a stable manner
- Textbook/textbooks should be included in course descriptions (when relevant)

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Comments

Teaching is largely based on lectures and practical courses and internships ("practical work module" at the Master´s level), and includes a final experimental thesis. There is little information about specific teaching methods that are used in the courses, but the overall impression from SER and discussions with staff and students is that mostly traditional approaches are followed, consisting of lectures and occasional literature-based seminars. These methods work well with the Bachelor level courses where the numbers of participating students are quite

high. The Master´s level courses involve fewer students, and thus would potentially give good opportunities to explore alternative, more student-involving and thereby potentially more effective approaches (see the Chapter "Students" below). According to the standard study plans, there is a good synchrony and fair balance between theoretical courses and practical lab work. Internship positions outside the University are in high demand and clearly insufficient.

Student surveys revealed a general satisfaction to the teaching in the gene technology programmes. In the Bachelor´s programme, the scores of student satisfaction with the learning outcomes (1.42 [-2,2]) and development of social skills (1.25) have both increased from the previous assessment. In the corresponding Master´s programme, satisfaction with learning outcomes is 1.2-1.3, whereas the Biomedicine programme obtained a significantly lower score of 0.22 (with a clear decrease from the earlier figure of 1.4). A similar difference between the two Master´s programmes exists in the students` assessment of how the programmes develop their social skills (GT: 1.1; Biomedicine: 0.44, again a drop from earlier score of 1.6). In the SER, the scores of the study programme in biomedicine are linked to students´ complaints about too little medical studies in the curriculum. However, this does not explain the drop from previous year as the course content has obviously stayed the same. As discussed above, measures have already been taken to increase the share of medical topics in the Biomedicine programme.

The students´ performance is largely evaluated by traditional exams. These tend to accumulate within a short period at the ends of terms, which may causes problems for the students, especially with larger/more difficult courses, and with students who work at the same time. Alternative or supplementary assessment methods like individual projects/essay tasks or on-line exams do not seem to be used, but would provide flexibility. Procedures for recognition of prior learning and work experience are clearly stated and transparent.

The Bachelor programme in Gene Technology includes an experimental final thesis worth 12 ECTS, whereas the Master´s programmes in Gene Technology and Biomedicine have theses of 30 and 40 credits, respectively. The Master´s theses are of good quality and meet the standards expected from theses at the same level internationally. The fact that a substantial number of the theses ends up in international scientific publications (as listed in SER) also speaks for their quality. The reason for the 10 ECTS difference in Master´s Theses between Gene Technology and Biomedicine programmes is not clear and seems unwarranted based on (non-systematic) inspection of examples and discussions during the site visit.

<u>Strengths</u>

- Top-level research and facilities provide an inspiring learning environment and good support for research-based teaching
- Master´s level programmes offer lots of so far unexplored possibilities for the introduction of new teaching methods and approaches

Areas for improvement

- Reasons for the poor performance and recent drop in scores of Master´s programme in Biomedicine in student surveys are unclear and deserve a careful analysis
- Assessment of students´ performance is largely limited to traditional exams
- The supply of positions for internships/practical work in companies and facilities outside University is very limited and in high demand

Recommendations

- New teaching (or learning) methods should be adapted and used more and in a varied manner in the Master´s level courses
- Alternative ways for student performance assessment should be considered to increase flexibility to the studies
- The ECTS volumes of the Master´s theses in Biomedicine and Gene Technology should be harmonized (unless there is a clear justification for the 10-credit difference)

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Comments

The CVs of the listed teaching staff of all three programmes show clearly that the staff have solid academic (and often international) training, and are very active in research in fields relevant to the study programmes. The staff includes a number of internationally visible scientists with strong publication records. Together with excellent infrastructure; the top-level researchers can provide a stimulating environment for the education and expert supervision for the Bachelor´s and Master´s thesis students.

In contrast to research merits, it seems that no comparable emphasis has been put on the development of pedagogical skills. The CVs (of teaching staff) do not indicate pedagogical training, but poor pedagogical skills are mentioned as one cause of changing lecturers in some courses. The University of Tartu organizes and offers several pedagogical courses for the teachers to improve their teaching skills interaction with students. More active participation in these courses would promote incorporation of new methods and approaches to the teaching. This is important in its own right, but also because a University-wide change in teaching philosophy from "teaching to learning", i.e., to more student-centred methods is planned to take place in the near future, as the panel learned from the vice-rector. The numbers of students participating in the Master´s programmes are low enough to facilitate various types of group work, problem-based learning, flipped classroom and related scenarios in teaching. Efficient adaptation of these approaches necessarily means increased demands of pedagogical and communication skills by the teachers.

Student feedback on teachers is regularly collected and analysed and has been generally positive. In cases of poor feedback, the programme directors discuss with the respective teacher(s) on how to improve the situation. This has also led to changes in lecturers.

From the SER, it is can be seen that a number of top researchers are also involved in teaching, but is it less clear how the teaching load and student supervision are distributed between the staff.

Strength

- The staff is highly active in research at an international level in many fields relevant for the programme

Areas for Improvement

- There is potential for improvement in the pedagogical training of the academic staff
- Distribution of the teaching hours between the staff is unclear (in the SER)

Recommendations

- Encourage the teaching staff to obtain pedagogical training and to use new teaching methods and experiment with their possibilities

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Comments

Despite the unfavourable demographic trends, and in contrast to other UT programmes in the field of Life Sciences, the Gene Technology programmes and the Master´s Programme in Biomedicine have been able to fill the available student places. Obviously, the programmes are well-known and respected among the prospective students. Also, the dropout rates in these programmes are lower than in Biology and EBC programmes, and at reasonable level: 60-70 % of student graduate within the nominal time for the degree, and 90 % or more if one additional study year is counted.

As discussed above, feedback from students is collected regularly and in a systematic fashion. The students also feel that their opinion counts and often leads to changes. The students appear to be generally satisfied with the quality and content of teaching although there is variation between the programmes, the Master´s programme in Biomedicine receiving the least favourable evaluations, perhaps related to the perceived lack of sufficient medical content.

The international mobility of the students is quite low with only a few students going annually abroad to participate in Erasmus or similar exchange or visit programmes. On the other hand, the number of foreign students coming to UT is even lower. The main reason for the low number of foreign students is clearly the study language as most courses are taught only in Estonian. It is less clear, however, why so few students from UT use the possibility for spending a semester in a foreign University. In discussions with the students during the site visit, the panel learned that the situation is at least partly due to difficulties in finding enough courses from the host university which match the curriculum requirements in Tartu. For students, this can mean postponing some compulsory courses which may lead to a half or even one year delay in graduation. It must be mentioned, however, that not all students have

experienced such problems in Erasmus exchange, suggesting that the ways students are informed about exchange possibilities can also be improved.

Graduates generally find employment although not always in their own area, but there are no numerical data to substantiate this view. One potential problem is that there is not much biotechnology industry in Estonia or in Tartu region specifically. Quite many Master´s level student´s expressed their wish to continue to doctoral studies, typical of the field also in many other countries. From discussions with students, alumni and employers, the panel learned that there is a general satisfaction in the teaching, but that there should be more practical orientation and laboratory work to give better competence in job market. Clearly, this would require additional funds. One possibility worth exploring would be to increase the involvement of employers in the programme: an internships/practical training done in enterprises or laboratories outside University research during the studies was mentioned as a key to successful employment after graduation.

Finally, the panel was impressed by the outspokenness, healthy critical attitude and excellent English demonstrated by the present and former students of the programmes. This finding in itself serves as an evidence of good University education received.

Strengths

- The programmes have a respected status which helps to attract motivated students and provides a clear competitive edge to the graduates of the programmes

Areas for Improvement

- Student mobility (both in and out) is at a low level
- Quantitative information on the employment rates of graduates is not collected

Recommendations

- Actively encourage students to participate in international exchange by increasing flexibility in the curricular requirements and by improving information on possibilities
- Work towards increased number of opportunities of the students to find internships/practical training in companies

4. Assessment report of Environmental Protection SPG at University of Tartu

The University of Tartu (UT) as a national university of Estonia bears the responsibility for solving problems faced by the society by ensuring the continuity of Estonian intellectuals and language and culture and by contributing to the development of education, research and technology and other creative activities throughout the world.

The University has clear and ambitious strategic objectives for 2020. The SER does not say how these are reflected in study programme design and implementation, and how structural changes underway will influence programme design and implementation.

The new vice-rector for studies must be commended for setting an aim to transform learning at UT really student centred. This will include creating the most favourable conditions for student's personal development, incl. development of transversal skills, using flip-classroom approach, increasing the share of practical work, problem solving in groups, wide use of teaching assistants, etc.

The Faculty of Science and Technology (LOTE) is the main structural unit of the University of Tartu (until year 2016). The structure of LOTE is made up of six research and development institutes and the science education centre – all these are fairly autonomous financially and have broad right for decision making.

Two study programmes in Environmental Technology (ET) are the only ones in the group of Environmental Protection at the University of Tartu. They belong to the Faculty of Science and Technology. The courses are delivered mostly by staff of Institute of Ecology and Earth Sciences, Institute of Chemistry and Institute of Physics. Some of them belong to the top 1% cited researcher in the world.

ET study programmes combine the best environmental and technological knowledge available at UT into one highly versatile speciality. Students can use high quality modern laboratory equipment.

Summary of Conclusions and Recommendations

The programmes are of high quality and prepare good researchers in environmental technology.

Recommendations:

- Technology component should be strengthened;
- More social and economic context is needed for wider labour market prospective (research based learning does not necessarily mean learning for researcher's career!);
- More integrated interdisciplinary curricula;

- More support from the university side for work placement.

4.1. Environmental Technology (Bachelor/Master)

Until the end of academic year 2014/2015 a bachelor's programme "Environmental Technology" was delivered. However, from academic year 2015/2016 UT is admitting new students to a combined undergraduate programme "Geology and Environmental Technology". The most significant change is that the specialization to narrower specialties was removed from undergraduate studies and the specialization is taking place during Master's studies. This approach gives undergraduate students an opportunity to choose their speciality (environmental technology or geology) during their studies and not at admission.

Starting from the spring term 2015/16 a module "Environmental Management" will be offered in English as part of the Master's programme (in cooperation with Estonian University of Life Sciences).

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Comments

The main objective of bachelor's programme in Environmental Technology is to provide academic education in natural and environmental sciences that enables a graduate to continue studies in the master's programme. The main objective of Environmental Technology master's study programme is to provide comprehensive academic education in environmental technology, to give

knowledge about fundamentals in natural and environmental sciences for continuing studies in the doctorate programme and competence to work as a certain field specialist of environmental technology. The Master's programme in ET is giving narrower and more in depth specialist level education in ecological engineering, microbial processes technology, geo-technology, ecosystem technology, waste technology or environmental monitoring.

The main objective of the new curriculum is to give graduates broad and integrated academic education in Geology or in Environmental Technology (GET). The Master's programme in ET is giving narrower and more in depth specialist level education in ecological engineering (i.e. ecotechnology), microbial processes technology, geotechnology, ecosystem technology, waste technology or environmental monitoring.

The most important feedback from graduates and employers was that ET curriculum needs more practical courses and students should have more opportunities for internships and practices according to their specialization. The data collection and analysing skills should be improved. In the new GET programme internships and practical trainings are an important component and students can choose special courses from elective sub-module "Courses in entrepreneurship and administration" to improve their entrepreneurship skills. The GET programme also includes a course "*Laboratory and Enterprise Practice in Environmental Technology*" aiming at offering the students professional work experience in research facility, institution or company in the field of environmental technology, engineering and protection.

During last years more courses are thought in English. This gives ET study programme a chance to get international and start to attract foreign students. New semester module "Environmental management" (34 ECTS) for English speaking Master's students.

For better integration of knowledge from academic year 2014/2015 joint master's seminars and joint pre-defences of most of the specialisations are organised.

No surveys about the satisfaction of employers have been conducted yet. The programmes are very much oriented towards preparing new researchers in ET. Wider understanding of social, economic and political context is not developed enough.

<u>Strengths:</u>

- New programme in GET is well designed
- Joint master's seminars and joint pre-defences for specialisations

<u>Areas of Improvement</u>

- Wider labour market orientation;
- Wider understanding of social, economic and political context;
- Marketing of the programmes;

- Cooperation and coordination between the teaching staff of different specialisations in ET

Recommendations

- Reconsider the graduates' labour market orientation;
- Include the development of wider social, economic and political context into the programmes;
- Improve attractiveness and marketing of the programmes;
- Improve cooperation and coordination between the teaching staff (overlapping subjects).

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Strengths

- New buildings The absolute top of Estonian research facilities like *Physicum* and *Chemicum* are available for students
- Wide use of blended learning

Areas for improvement:

- Conditions and equipment in some auditoria and laboratories, especially in 46 Vanemuise St;
- Study materials, especially for practical courses and lab trainings;
- Resources for programme management (one Programme Manager with 0.25 work load is not enough for ensuring everyday needs of students).

Recommendations

- Improve conditions and equipment in some auditoria and laboratories, especially in 46 Vanemuise St;

- Allocate more resources for programme management.

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

During master's studies the supervisors are responsible of finding practical work experience opportunity for students and to evaluate its execution and in some cases programme manager or other academic staff members are helping with finding suitable places for students.

Strengths

- Some of bachelor's and master's thesis lead to international peer-reviewed scientific publications;
- RPL is well organised

Areas for improvement:

- Internship (practical training, work placement) mostly inside University.

Recommendations

- Improve labour market relevance through wider involvement of employers.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Strengths

- Most of lecturers are highly competent in their areas and are internationally acknowledged scientists;
- University has put a lot of effort into raising the quality of teaching and learning;

Areas for Improvement:

- Involvement of all teaching staff in developing student centred learning environment;

Recommendations

- Individual development and improvement of lecturers' teaching skills;
- Involve more practitioners and foreign lecturers;

Students

Standards

- ✓ Student places are filled with motivated and capable students.

- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Strengths

- Student places are filled with motivated and capable students;
- Environmental Technology Facebook page;

Areas for Improvement:

- Mobility of students: All students have an opportunity (they usually do this during Master's studies) to study abroad and this is highly supported by the University. Nevertheless, the mobility is quite low;
- Admission to bachelor's studies (Despite marketing activities undertaken admission numbers in BSc programme are decreasing);
- Dropout rate during the first year is high in BSc programme

Recommendations

- More support from the university side for work placement
- Student guidance and tutoring;
- More scholarship options and financial support to students