



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus universiteto

**STUDIJŲ PROGRAMOS *MOLEKULINĖ BIOLOGIJA*
(621C71002)**

VERTINIMO IŠVADOS

**EVALUATION REPORT
OF *MOLECULAR BIOLOGY (621C71002)*
STUDY PROGRAMME
at Vilnius University**

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Išvados parengtos anglų kalba
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Vilnius
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DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Molekulinė biologija</i>
Valstybinis kodas	621C71002
Studijų sritis	Biomedicinos mokslai
Studijų kryptis	Molekulinė biologija, biofizika ir biochemija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	antroji
Studijų forma (trukmė metais)	Nuolatinė (1,5)
Studijų programos apimtis kreditais	90
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Molekulinės biologijos magistras
Studijų programos įregistravimo data	2011-07-12 įsakymo nr. 1-01-94

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Molecular biology</i>
State code	621C71002
Study area	Biomedical Sciences
Study field	Molecular biology, biophysics and biochemistry
Kind of the study programme	University studies
Study cycle	second
Study mode (length in years)	Full-time (1,5)
Volume of the study programme in credits	90
Degree and (or) professional qualifications awarded	Master of Molecular Biology
Date of registration of the study programme	12-07-2011, order no. 1-01-94

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The Centre for Quality Assessment in Higher Education

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I. INTRODUCTION

In 2014, the Centre for Quality Assessment in Higher Education started the procedure of evaluation of the Study Programme in Molecular Biology at the Vilnius University, Lithuania, according to the Procedure for the External Evaluation and Accreditation of Study Programmes (Order No ISAK-1652 of 24 July 2009 of the Minister for Education and Science of the Republic of Lithuania - *Official Gazette*, 2009, No 96-4083).

The evaluation expert team consists of:

- Prof. Dr. Laurent Counillon (group leader) – University of Nice, France;
- Prof. Dr. Christoph Griesbeck, Head of Department and Study Programs Biotechnology – MCI – Management Center Innsbruck, Austria;
- Prof. Dr. Meza Trine Johansen - Assistant Deputy Director General, Department of Quality Assurance NOKUT, Norway;
- Julius Gagilas, Director of company “Diagnolita”, Lithuania;
- Benas Gabrielis Urbonavičius, Student representative, Kaunas University of Technology, Lithuania.

The Self-Evaluation Report and the additional documents were delivered to the evaluation team in due time. At the 18th of March 2014, according to procedure, the evaluation team performed a site-visit to Vilnius University and met the management, self-evaluation report writing team, teachers, students, alumni and social partners at the Master Study Programme in Molecular biology.

The programme has been run at the Faculty of Natural Sciences (FNS) of Vilnius University since 2011, and this is the first time the programme is evaluated by an external committee appointed by the Centre for Quality Assessment in Higher Education.

The Molecular Biology master programme has a duration of 90 ECTS (1.5 years duration of study), and the expert panel think that it worth considering if this is an optional duration of such a programme, both considering if it would be possible for the students to reach the master degree level in this time and for the students that would like to go abroad pursuing an academic career by searching for Ph.D.-positions they might have a problem entering the Ph.D.-programmes in some other countries.

II. PROGRAMME ANALYSIS

1. Programme aims and learning outcomes

The Programme aims and learning outcomes are published on the website of VU in Lithuanian, as well as on the website of the Department of Biochemistry and Molecular Biology in Lithuanian and in English. In the descriptions of the taught subjects of the programme, presented on the website of the Department, particular aims and the main intended learning outcomes of these subjects are presented as well (SER, p14).

The expected Programme outcomes fall into the following broad areas: knowledge and understanding, ability to perform research, critical thinking and independent action, communication, practical skills, personal effectiveness (SER, p 9), and they include more specifically knowledge and understanding of molecular cell biology, ability to perform research, critical thinking and independent action, communication skills, personal effectiveness and practical skills.

The aim of the programme shows that there is a progression from the bachelor to the master degree level. For example the molecular biology bachelor programme given at Vilnius University has the following aim *“To develop practical skills to perform molecular biology laboratory procedures, to work with standard biomedical science equipment, apply methods of bioinformatics”*, while the master degree programme has the following aim: *“To master the competences for creative application of theoretical knowledge, methods and technologies of molecular biology and related sciences in research and practical work, ability to work in interdisciplinary areas and use knowledge of different scientific fields”* (Table 1, Aim B, SER, page 9), which clearly shows the progression between the bachelor and master degree programme level. This progression is also evident in the learning outcomes. The learning outcomes for the study programme are consistent with the master degree level.

According to the SER the needs of the labour market are integrated in the design of the aims and learning outcomes (SER, page 14). The Study Programme Committee includes social partners (names and positions are given in the SER, Table 6, p32) who may give suggestions in order to match the aims and outcomes to the needs of labour market. During the meeting with social partners during the site visit however, the expert panel found that there are additional needs from the social partners that should be integrated into the programme. It should be included courses in management skills, laboratory quality management systems, intellectual property (IP) management and similar competencies that is needed if the students should work in companies after completion of their master degree.

The final thesis is based on the student's independent research and represents a creative project where the students implement their ideas, knowledge and combine it with different methodologies. The thesis is the final step in the Master Programme and represents the overall integration of the knowledge and skills in line with the learning objectives of the programme. The expert panel find that the time for the master work may be too short due to the fact that this is a programme of 90 ECTS and have a duration of 1 ½ years. For master thesis that is dependent on laboratory work as this one, this may be challenging. It may also be difficult for the students to reach all the learning outcomes for the programme due to the fact that the programme is 90 ECTS. The expert panel also has a concern about that it might be difficult for the students to get admission into PhD programmes abroad when the programme is 90 ECTS.

The name of the study programme, master of molecular biology reflects the contents of the study programme and the aim of the programme.

2. Curriculum design

The structure of the Molecular Biology master degree programme meets the legal requirements of a master study programme (SER, page 15). The total number of credits is 90 that are given after the completion of 3 semesters of study. A total of 60 ECTS is given for study field specific subjects. Of the total ECTS awarded for the programme, 38 are awarded for compulsory courses, including subjects that include practical training. 22 credits are awarded for elective courses. These courses can be chosen from three different conceptual blocks (SER, page 15 and annex 2), the first one contains subjects that aim to deepen knowledge and skills in cell and macromolecular research techniques, while the second aim to deepen knowledge and understanding of molecular biology model systems and their use in fundamental and applied research. The last block aim to deliver knowledge and understanding of molecular processes leading to distributed cell states and pathological processes.

Some of the elective courses in this programme are also given to students that follow the Biochemistry and Genetics master programmes (SER, page 16). The SER does not state if the students have to choose certain combinations of subjects from the different elective courses, and how they get information about how to choose so that they obtain a degree that contains the best possible combination for their curricula. This was discussed during the site visit, and both in the meeting with students and teachers it was stated that the students can choose freely. The students get information about the subjects from other students and from teachers. It is the expert panel's opinion that the students should get some more information about the best combinations of the elective courses, and that there should be some combinations that are recommended for the students. In this way, the students will get the best possible combination for their curriculum.

In the first semester, the students have to choose elective courses that will total give 9 credits, and in this semester there is only one subject that is given 4 credits (Systems biology, annex 1) and the rest give 5 credits (annex 1). This limits the options for choosing for the student. The expert panel believes that the study programme committee should go through the credits given for each elective subject for all semesters, and evaluate the credits given for each subject is correct. This must be seen in the connection with the recommendation of giving the students more information about the combination of elective courses given above.

The programme contains a master thesis that is awarded 30 ECTS and according to the SER this is the most essential part of the programme (SER, page 17). The practical part of the master thesis is conducted research laboratories either at the university, research institutes or private companies (SER, page 16). In addition to the master thesis, the programme includes two subjects, research practice I and II, that is also prepared under supervision in research laboratories' as a preparation for the master thesis. The expert panel agrees with the statement that the master thesis is an important part of a master programme, and think that the design with the research practise I and II in addition master thesis is good. During the site visit experts also learned that the students may change laboratories after research practice I and II, even if this is not common. In the experts' panel opinion, the students should be encouraged to change research groups between the practices and the master thesis, to broaden their experience.

One of the intended learning outcomes of the study states that the students will "achieve knowledge of the basic molecular mechanisms leading to the emergence and development of the disturbed cell states and pathological processes" (Learning outcome A4, page 12). When analysing the only compulsory course stated to cover this learning outcome (Table 2, links between intended learning outcomes and its subjects, SER, page 12-14), it became evident that the course, Molecular Cell Biology does not cover all the aspects of this learning outcome (Annex 2). The elective courses stated to cover the same intended learning outcome, does however deal with distributed cell states (for example Cancer cell biology and Molecular Mechanisms of Pathogenesis). During the site visit, it was discussed if the students

have to choose one of these elective courses, and it was clarified that they do not have to do so. The learning outcome “knowledge of molecular biology model systems, methods and technologies to investigate cells, their components and processes” (Learning outcome A2, page 12) is also stated to be covered by subjects that are mostly elective. During the discussions with the teachers and the committee responsible for preparing the SER, it was clarified that for the two examples given above, there are other courses that also will cover these learning outcomes, and thereby the expert panel conclude that these two learning outcomes will be possible to reach with the current curriculum design.

In the SER page 8, it is stated that the LO of the programme (given in Table 1) involve among others “ability to be responsible for decisions taken and ability for leadership”. The curriculum does not include any subjects covering management, economy, or some other skills that will be necessary to be able to manage a laboratory for example in the industry. This was also mentioned in the meetings with the social partner, and the expert panel believes that such subjects should be included in the curriculum to assure that the students will achieve this learning outcome.

During the work with research projects I and II, as well as during the work with the master thesis, the students will work in research laboratories and by means of this they will get in touch with the latest achievements in science and technology as they will be part of an active research environment. The subjects also cover the latest achievements, and the both the overview of the theory covered and the literature used indicates this. For the subject Molecular Cell Biology, the literature includes in addition to more traditional books such as *Molecular Biology of the Cell*, (New York, Garland Sciences), different handbooks from companies such as Applied Biosystems (Annex 2, course descriptions). This is an excellent way of ensuring that the students learn the latest technologies.

In many of the courses, such as the compulsory course *Cell technologies*, and the elective courses *Bioethics* and *Cancer molecular biology*, the literature list includes topic related scientific reviews and/or the teaching methods includes analysis of topic-related scientific paper (Annex 2, course descriptions). In the compulsory subject *Molecular cell biology*, the teaching methods include Journal Club which means that the students read and discuss/ analyse selected research papers. These teaching methods and the choice of using the latest literature as subject literature was also discussed with both teachers and students during the site-visit and both groups highlighted this as very important. The choice of the above-mentioned teaching methods combined with using the latest articles as literature ensures that the students get familiar with the latest achievements in science and technology. The students also get familiar with reading scientific literature while preparing the thesis as well as in the research project I and II.

3. Staff

Competence of the academic personnel of the Programme is in full compliance and exceeds the legal requirements (SER, p 20). The study programme is thought by 26 teachers, of which 10 are full professors, 7 associate professors and 9 are lecturers holding a PhD (SER, page 19). This means that the teaching staff meets all the legal requirements, as the requirement for a second cycle programme is that 80 % should hold an academic degree, and 20 % should be a professor. For the Master degree programme in Molecular Biology the whole staff holds a PhD and 42 % are professors. According to the SER the supervisors for the master thesis also holds a PhD. The amount of teachers involved in this programme seems adequate for ensure that the students will achieve the intended learning outcomes. If the provision is changed as recommended by the expert panel to include courses in management and economy, it is important that the university include staff with these skills.

The teachers have the possibilities to take courses in pedagogy to enhance their teaching abilities. During the meeting with the staff, the expert panel found that many of the teachers had taken such courses given by the university. The panel also found that there seems

not to be a systematic way of assuring that all the teachers enhance their competencies by taking such courses, and the panel thereby recommends that the faculty makes a system for monitoring such activities and by means of this assures that all the teachers will take some pedagogical qualification courses.

When it comes to enhancing the professional development in science, there seems to be systems in place for this. Many of the teachers hold their PhD from Vilnius University this could possibly lead to a closed environment. By legislation of the University, the teachers enhance their professional qualifications by going to long- and short-term visits to universities and research centers in different countries, and participate in national and international conferences, workshops and seminars (SER p 21, annex 4-5). Examples of such activities the last 2 year research stays at the University of Vienna, Austria; The Norwegian Radiumhospital, Norway, Workshop on Confocal Microscopy “Advanced techniques for modern biology”, Poland, among others. During the site-visit, the teachers also told that they were encouraged to go to both conferences and research visits abroad and that the university where helpful changing the teaching schedules so that such activities were possible.

The teachers are active researchers and most of them are active participants of national as well as international scientific programmes. Teaching staff participate in NATO, COST, and Norwegian Financial mechanism research programmes and some of the teachers have headed or participated in running EU Structural Funds funded projects; (SER, p 20 and Annex 5). The list of international and national publications in the academic staff’s CVs show permanent and a high-quality research activity and all the staff have been publishing during the last few years (Annex 4 and 5), many in high impact international journals.

4. Facilities and learning resources

The Faculty of Natural Sciences has 28 auditoriums of which most are equipped with multimedia equipment. The capacity of two of these auditoriums is for 100 students, two for approx. 65 students, three for 50 students and five for 40. The capacity of the remaining auditoriums is lower (SER, 21 and 22).

There are teaching laboratories of Molecular Biology, Cell Biochemistry as well as equipment and facilities for laboratory work in other rooms. The practical parts of the courses are carried out at different places: at the Department of Biochemistry and Molecular Biology of FNS, Proteomic Centre and Department of Biomodels of Institute of Biochemistry, Research Centre of Institute of Oncology, Department of Immunology of Centre of Innovative Medicine (SER, p 22). The students are performing the research in connection with their master thesis in different research groups at different locations. During the site-visit, the expert panel reviewed the facilities both in the department of Biochemistry and Molecular Biology and at the Institute of Biotechnology. The expert panel found that the laboratories are well equipped with excellent research equipment. Since there are fewer students at the master programme than in the bachelor programme in molecular biology, the expert panel is of the opinion that the facilities are better for these students and the point made about the somewhat insufficient space in facilities and auditoriums for the bachelor study programme does not apply for this programme.

The Library has a capacity of 40 places but is also connected to the university computer network via which students in the campus or elsewhere outside the university can easily access the available e-resources, either local or web-based (SER, p 23). The students have access to online journals and databases, both from campus and from home (via VPN) and the students were very satisfied with this.

5. Study process and student assessment

The admission criteria for the students are precise and well founded and are given in the Molecular Biology Self-Evaluation Report page 24. The background of the students entering the study programme is a bachelor degree in Molecular Biology, Biochemistry, Genetics and Biophysics. The general information about the admission to VU, General information about admission to VU, admission rules and composition of competitive score is defined in the “Rules of admission to the second cycle studies”, that are being approved in by VU Senate Commission and announced in the VU website; <http://www.vu.lt/kviecia/rinkis-studijas/ka-studijuoti/2-pakopos-studiju-programos/item/291>

The expert panel finds that the organization of the studies is generally effective, fulfilling the aims and the outcomes of the programme.

During the study process, the students are encouraged to participate in research both during the master thesis work and during research project I and II. During the site-visit, the expert panel found that the students may change research topic/research laboratory between research project I and II and/or between the projects and the final thesis. This is however, a rare event, and the expert panel found that this reflects that the system is more lab/researcher oriented than student oriented, and that the students should be encouraged to change as this will give the students a broader competence which can be positive for their later career. The expert panel also wants to stress that it should be possible to write a thesis without specific scientific results from one research area, and changing laboratories should thereby not influence the student’s possibilities of getting a good mark on their final thesis. The social partners also mentioned that they would find students with a broader experimental experience very interesting for employment. As experts have written under the curriculum part, it was found that the design is good, but for student process experts’ group should mention that they should be encouraged to change to get more experience.

The students have the possibilities to participate in student exchange programmes, but this has to be more elaborated, so that there will be an actual possibility for the students.

The assessment strategies are diverse and include evaluation of mid-term exams, final exams, tests, seminars, practical exercises, laboratories; discussion groups/project groups, presentations, and project work, reviews, analyses, reporting. Formative assessment methodology includes discussions and presentations, laboratory exams, peer learning and evaluation, students self assessment, surveys, solutions for the certain problems. Laboratory work is assessed both in formative (during the year) and summative ways (research project defence, Master thesis defence). The assessment strategy is clear for the students and they are aware of the system and mark calculations.

During the site-visit the expert panel met graduates who all were working in research laboratories, some of them wanted to pursue an academic carrier by taking a doctoral degree. Some of the graduates said that it could be a problem that they are finished half a year before they can enter the ph.d.-programme, while others meant that it could be positive that they have graduated before the student that follow a master study programme of 2 years duration.

6. Programme management

Responsibilities and monitoring of the programme are clearly distributed both on University and the Faculty level and on the Department level as well (The Molecular Biology Self-Evaluation Report, p30-31). The major changes in the study programme are the responsibility of the Senate and Council, while the changes within the content The master degree study programme in *Molecular Biology* was initially developed and is being constantly updated by the Study Programme Committee, which is also in charge of programme quality and

implementation (SER, pg 41-42). The Study Programme Committee is formed by the Faculty Council and approved by the Senate. A Study Programme Committee must include representatives of social partners and the students, and a table in the self-evaluation report giving the names and position of the members of the committee shows that committee in fact has representatives from both social partners and the students (Table 12, SER, page 42). The Study Programme Committee is responsible for adjusting and modifying the programme, both at the small-scale and large-scale.

Internal quality assurance measures and policy are well placed (the Molecular Self-Evaluation report, p 33-34) and with clearly distributed responsibilities on all levels. The main responsibility for the quality of the study programme lies on the Study Programme Committee, which will get support from the Quality Management Center of Vilnius University. The on-line system for the semester student evaluation of the study programme and courses is managed by the central system and is important for the improvement of the study programme. However, there is no high response level as these surveys are not mandatory (site-visit meeting with students and teachers) since the students have the opportunity to give their remarks directly to the teachers during the contact hours. The students also mentioned during the site-visit, that they do not get feedback on the surveys and this might lead to a low response rate. Some teachers also do they own surveys to get feed-back, which the expert panel think is very positive.

III. RECOMMENDATIONS

1. Consider to increase the programme to 120 ECTS as this is an experimental science.
2. Include some subjects that cover management skills, laboratory quality management systems, intellectual property (IP) management and similar competencies so that the students will be able to achieve the learning outcome “*ability to be responsible for decisions taken and ability for leadership*”.
3. The students should get some more information about the best combinations of the elective courses, and there should be some combinations that are recommended for the students to give the students the best possible combination for their curriculum.
4. Erasmus exchange programme or other exchange programmes should be more enhanced both for teachers and students.
5. The faculty should make a system for monitoring teaching staff enhancement such as pedagogical qualification and thereby assure that all the teachers take some of these courses.

IV. SUMMARY

The Master Study Programme in Molecular Biology at the Vilnius University is a well-designed, research-based study programme. The aims of the study programme reflect research in this area. The learning outcomes for the study programme are well designed and appropriate for the Master level studies.

The subjects are distributed evenly and the number of courses per semester is in accordance with legislature. The credits given for all the elective courses should be evaluated by the study programme committee to find out if the courses have been given the correct number of credits. This must be seen in the connection with the recommendation of giving the students more information about the combination of elective courses. In this way the student will be able to choose the best combination for their individual curricula.

The Master thesis represents the integration of the overall knowledge and skills. The students are able to do the practical part of their master thesis in an active research environment and they have the chance of choosing laboratories both at the university, in research centers and in private companies.

The programme reflects the latest achievements in science and is more than appropriate for the level of study. All of the teachers are active researchers, participants in scientific programs and their competencies exceed the legal requirements. They also have a significant experience working in other institutions in the country and abroad. Equipment is modern and appropriate for the provision of the study programme, and this will be even better when the new research building will be opened.

The admission criteria for the students are precise and the organization of the studies is effective. The students express a great level of satisfaction with Master studies in molecular biology, including lectures, support, contact hours, mentoring system and laboratories. The students do not participate in the mobility programs to an extent that is satisfactory and this should be enhanced

Responsibilities and monitoring of the programme are clearly distributed. Experts recommend that the study programme makes even more active links to social partners, and involve these in the learning outcome development.

Internal quality assurance measures and policy are well placed. The students have the opportunity to influence study programme and courses content and evaluation by their representative in the Programme Committee.

V. GENERAL ASSESSMENT

The study programme Molecular biology (state code – 621C71002) at Vilnius University is given **positive** evaluation.

Study programme assessment in points by evaluation areas.

No.	Evaluation Area	Evaluation Area in Points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	3
3.	Staff	4
4.	Material resources	4
5.	Study process and assessment (student admission, study process student support, achievement assessment)	3
6.	Programme management (programme administration, internal quality assurance)	4
	Total:	21

*1 (unsatisfactory) - there are essential shortcomings that must be eliminated;

2 (satisfactory) - meets the established minimum requirements, needs improvement;

3 (good) - the field develops systematically, has distinctive features;

4 (very good) - the field is exceptionally good.

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V. APIBENDRINAMASIS ĮVERTINIMAS

Vilniaus universiteto studijų programa *Molekulinė biologija* (valstybinis kodas – 621C71002) vertinama teigiamai.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	3
2.	Programos sandara	3
3.	Personalas	4
4.	Materialieji ištekliai	4
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	4
	Iš viso:	21

* 1 - Nepatenkinamai (yra esminių trūkumų, kuriuos būtina pašalinti)

2 - Patenkinamai (tenkina minimalius reikalavimus, reikia tobulinti)

3 - Gerai (sistemiškai plėtojama sritis, turi savitų bruožų)

4 - Labai gerai (sritis yra išskirtinė)

IV. SANTRAUKA

Vilniaus universiteto molekulinės biologijos magistro studijų programa yra gerai parengta ir moksliniais tyrimais pagrįsta studijų programa. Jos tikslai atspindi tyrimus šioje srityje. Studijų programos studijų rezultatai yra gerai suformuluoti ir atitinka magistro lygmens studijas.

Studijų dalykai yra tolygiai paskirstyti ir jų skaičius per semestrą atitinka teisinius reikalavimus. Studijų programos komitetas turėtų įvertinti visus už pasirenkamuosius dalykus skiriamus kreditus, siekiant išsiaiškinti, ar dalykams suteiktas tinkamas kreditų skaičius. Tai reikėtų daryti atsižvelgiant į rekomendaciją suteikti studentams daugiau informacijos apie pasirenkamųjų dalykų derinius. Taip studentas galės pasirinkti geriausią derinį savo individualiam studijų turiniui.

Magistro baigiamasis darbas – tai visų žinių ir įgūdžių sujungimas į bendrą visumą. Studentai geba atlikti praktinę magistro baigiamojo darbo dalį aktyvioje mokslinėje aplinkoje ir turi galimybę rinktis iš laboratorijų universitete, tyrimų centruose ir privačiose įmonėse.

Studijų programoje atsispindi naujausi mokslo pasiekimai ir ji puikiai atitinka studijų lygmenį. Visi dėstytojai yra aktyvūs tyrėjai, mokslinių programų dalyviai, o jų kompetencija

viršija teisinius reikalavimus. Taip pat jie turi daug darbo su kitomis šalies ir užsienio įstaigomis patirties.

Įranga yra moderni ir tinkama studijų programai vykdyti. Situacija dar pagerės, kai pradės veikti naujas mokslinių tyrimų pastatas.

Studentų priėmimo kriterijai yra tikslūs, o studijos organizuojamos efektyviai. Studentai nurodė, kad jie yra labai patenkinti molekulinės biologijos magistro studijų programa, įskaitant paskaitas, paramą, kontaktines valandas, vadovavimo sistemą ir laboratorijas. Studentai patenkinamai dalyvauja mobilumo programose ir tai reikėtų tobulinti.

Atsakomybė už programą ir jos stebėseną – aiškiai paskirstytos. Ekspertai rekomenduoja studijų programoje dar aktyviau palaikyti ryšius su socialiniais partneriais ir įtraukti juos į studijų rezultatų formulavimą.

Vidaus kokybės užtikrinimo priemonės ir politika veikia gerai. Studentai turi galimybę daryti poveikį studijų programos ir dalykų turiniui, taip pat vertinimui per savo atstovą Programos komitete.

III. REKOMENDACIJOS

1. Apsvarstyti galimybę padidinti programos kreditų skaičių iki 120 ECTS, nes tai eksperimentinis mokslas.
2. Įtraukti dalykų, kurie apima vadybinius įgūdžius, laboratorijų kokybės vadybos sistemas, intelektinės nuosavybės vadybą ir panašias kompetencijas, kad studentai galėtų pasiekti studijų rezultatą „*gebėti prisiimti atsakomybę už padarytus sprendimus ir gebėti vadovauti*“.
3. Studentai turėtų gauti daugiau informacijos apie geriausius pasirenkamųjų dalykų derinius ir reikėtų studentams tam tikrus derinius rekomenduoti, kad studijų turinyje jiems būtų pasiūlytas kuo geresnis variantas.
4. Tiek dėstytojų, tiek studentų *Erasmus* mainų programą arba kitas mainų programas reikėtų tobulinti.
5. Fakultetas turėtų sukurti dėstytojų tobulėjimo, pavyzdžiui, pedagoginės kvalifikacijos, stebėsenos sistemą ir taip užtikrinti, kad visi dėstytojai dalyvautų kokiuose nors kursuose.

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