



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus universiteto

**STUDIJŲ PROGRAMOS *BIOFIZIKA (612C72001)***

**VERTINIMO IŠVADOS**

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**EVALUATION REPORT  
OF *BIOPHYSICS (612C72001)***

**STUDY PROGRAMME**

at Vilnius University

1. Prof. dr. Kari Keinänen (team leader) *academic,*
2. Prof. dr. Helmut Grubmüller, *academic,*
3. Doc. Bruno Cardinaud, *academic,*
4. Prof. dr. Laima Ivanovienė, *academic,*
5. Benas Gabrielis Urbonavičius, *students' representative.*

Išvados parengtos anglų kalba  
Report language - English

Vilnius  
2014

## DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Biofizika</i>
Valstybinis kodas	612C72001
Studijų sritis	Biomedicinos mokslai
Studijų kryptis	Molekulinė biologija, biofizika ir biochemija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	pirmoji
Studijų forma (trukmė metais)	Nuolatinė (4)
Studijų programos apimtis kreditais	240
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Biofizikos bakalauras
Studijų programos įregistravimo data	2009-08-17

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## INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Biophysics</i>
State code	612C72001
Study area	Biomedical Sciences
Study field	Molecular biology, biophysics and biochemistry
Type of the study programme	University studies
Study cycle	first
Study mode (length in years)	Full time (4)
Volume of the study programme in credits	240
Degree and (or) professional qualifications awarded	Bachelor of Biophysics
Date of registration of the study programme	17-08-2009

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## I. INTRODUCTION

### 1.1. *Background of the evaluation process*

The evaluation of on-going study programmes is based on the **Methodology for evaluation of Higher Education study programmes**, approved by Order No 1-01-162 of 20 December 2010 of the Director of the Centre for Quality Assessment in Higher Education (hereafter – SKVC).

The evaluation is intended to help higher education institutions to constantly improve their study programmes and to inform the public about the quality of studies.

The evaluation process consists of the main following stages: 1) *self-evaluation and self-evaluation report prepared by Higher Education Institution (hereafter - HEI)*; 2) *visit of the review team at the higher education institution*; 3) *production of the evaluation report by the review team and its publication*; 4) *follow-up activities*.

On the basis of external evaluation report of the study programme SKVC takes a decision to accredit study programme either for 6 years or for 3 years. If the programme evaluation is negative such a programme is not accredited.

The programme is **accredited for 6 years** if all evaluation areas are evaluated as “very good” (4 points) or “good” (3 points).

The programme is **accredited for 3 years** if none of the areas was evaluated as “unsatisfactory” (1 point) and at least one evaluation area was evaluated as “satisfactory” (2 points).

The programme is **not accredited** if at least one of evaluation areas was evaluated as "unsatisfactory" (1 point).

### 1.2. *General*

The Application documentation submitted by the HEI follows the outline recommended by the SKVC. Along with the self-evaluation report and annexes, the following additional documents have been provided by the HEI before, during and/or after the site-visit:

No.	Name of the document

### **1.3. Background of the HEI/Faculty/Study field/ Additional information**

Vilnius University (VU) is the biggest university of Lithuania with 23 core academic units, including 12 Faculties and two Institutes with Faculty Status. The first cycle study programme in Biophysics is run within the Department of Neurobiology and Biophysics, Faculty of Natural Sciences (FNS). The programme was launched in 2002, and was evaluated by national experts in 2007 and accredited without conditions, and received a further accreditation in 2009 by the Centre for Quality Assessment in Higher Education valid until the end of 2014.

### **1.4. The Review Team**

The review team was completed according *Description of experts' recruitment*, approved by order No 1-55 of 19 March 2007 of the Director of the Centre for Quality Assessment in Higher Education, as amended on 11 November 2011. The team conducted the Review Visit to Vilnius University on Wednesday 17th September 2014.

1. **Prof. dr. Kari Keinänen (team leader)**, *Department of Biosciences, University of Helsinki, Helsinki, Finland.*
2. **Prof. dr. Helmut Grubmüller**, *Department of Theoretical and Computational Biophysics, Max Planck Institute for Biophysical Chemistry, Göttingen, Germany.*
3. **Doc. Bruno Cardinaud**, *INSERM U1035, University of Bordeaux Segalen, Bordeaux, France.*
4. **Prof. dr. Laima Ivanovienė**, *Department of Biochemistry, Lithuanian University of Health Sciences, Kaunas, Lithuania.*
5. **Mr. Benas Gabrielis Urbonavičius**, *Ph.D. student of Kaunas University of Technology, Kaunas, Lithuania.*

## **II. PROGRAMME ANALYSIS**

The expert panel met with administrative representatives, the self evaluation report group, teaching staff, students at both Bachelor and Masters levels, as well as alumni and social partners. The panel visited the facilities at the National Cancer Institute (NCI). The panel received a very concise and informative self-evaluation report and very helpful material, which is highly appreciated by the expert panel.

## ***2.1. Programme aims and learning outcomes***

The Biophysics Bachelor programme was established 2002/2003 and aims at integrating the achievements of modern technology, physics, and life sciences. Relevant societal areas are treatment of diseases, information technology, and nanotechnology. Therefore, the relevance of the programme for economy and society is clearly established. It is expected that most students will continue in the Masters programme, which is clearly supported by recent statistics (82%) as well as by the expressed interest of the students. It is indeed encouraging to see that about half of the Masters students proceed towards a PhD, and that the other half typically finds good jobs in a broad range of occupations.

It is expected that this programme helps coping with and combining the complexity of the life sciences with the mathematical rigor and quantitative character of physics-based approaches from a fundamental level. A solid background in both, the relevant biological systems and principles, and well as basic mathematics and physics concepts and approaches are therefore required.

These aims are clearly laid out in the curriculum and they meet the public needs as well as the labor market. The programme aims and intended learning outcomes are published on the VU homepage and in brochures. The overarching Biophysics theme of the programme is reflected by the learning outcomes, content, and qualification.

Within the very general biophysics scope, and given the diversity of fields, concepts, and techniques, to achieve a proper balance between physics and biology courses is a considerable challenge. As will be discussed further below, the panel felt that the curriculum's center of mass is on the biological side, with fundamental physics concepts not yet fully implemented to an extent that would ensure the proper understanding of the diverse involved concepts and techniques. The panel is aware that this issue is being actively discussed within the involved faculties and teaching staff as well as within the study programme committee. So far, this discussion has not yet been fully concluded. The overarching aim and programme learning outcomes are fully compatible with the name of the programme; the professional and academic requirements are fully implemented on the biology side of the programme, but only to a limited extent on its physics side. The programme aims and learning outcomes are also consistent with the type of studies and correspond to Bachelor level.

In summary, the programme has the clear potential of filling an important gap and providing a very important bridge between the fundamental sciences physics and the life sciences. Experts feel that this potential is not yet fully exploited, to a large extent but not only due to structural and institutional restrictions.

## ***2.2. Curriculum design***

The structure of the programme is set up according to the requirements laid down by the Ministry of Education and Science and “Regulations for VU study programmes”. Over the period of 4 years the students take courses totaling 240 credits, evenly balanced over the years.

The somewhat bipolar nature of the programme still reflects its history and the recent merger of two programmes, one from biology, the other from physics. Whereas the Masters Programme is jointly organized by the physics and neurobiology department and therefore has already achieved a more balanced – albeit not yet fully integrated – vision, the focus of the Bachelor programme still seems to be more on the biological and even medical side. As the most pronounced consequence, the panel noted that there are relatively few courses, and a correspondingly small number of credits, devoted to teaching the canon of fundamental physical concepts required for an in depth understanding of biophysical techniques that rest on these concepts. In contrast, the relatively detailed spectrum of biological courses, albeit welcomed by most students, does not seem to be of similarly high relevance to the expressed aims of the programme. As a consequence, the challenge of teaching both physics and biology (and chemistry) fundamentals is currently met by focusing on the basics only, while the relying on the students’ ability to learn core concepts fully by themselves. In order to make room for courses covering canonical fields of physics like mechanics, statistical mechanics/thermodynamics, electrodynamics, and quantum mechanics / molecular physics, some biology courses could be made elective (e.g. General Zoology, Basics of Botanic and Mycology, Plant Physiology). Of minor note, the course of cell biology (semester 7) might be shifted earlier in the curriculum.

It is positively noted that the curriculum has already been modified to a right direction based on the recommendations of the previous evaluation and on in-house analyses and developments in the labor market. As a result, a modern course Molecular Biophysics has been launched, and more physical chemistry and quantum mechanics have been introduced. The review team regards these changes as most welcome and appropriate.

Whereas there is a continuous teaching effort in professional skills and good scientific practice within some of the courses, no systematic course in bioethics or research ethics is provided. At the same time, the introduction course focuses mostly on University and information sources as well as later project work.

It is to be applauded that students are involved very early into research projects. There are lists of possible research projects for the students to choose from. Generally students are very proactive in their choice of their research direction. A culture of encouraging rotations between different labs during the Bachelor, Masters, and PhD work exists, thus broadening the students’

perspective and practical experience. Overall, relatively small size of the programme enables efficient counseling and advice on a very informal basis. This system has been implemented successfully, as reflected by the fact that the students clearly noted that it is straightforward for them to find good projects and labs. As a result, the level of research work and of the supervision by the PIs is very high, as reflected by the high quality of the submitted theses.

Despite the evident biological bias, the scope of the subjects covered and the contents and teaching methods of the specific courses are generally consistent with a bachelor-level programme in biophysics and with the defined learning outcomes. Also the students expressed a high level of satisfaction with their opportunities and support in the programme.

### ***2.3. Teaching staff***

The BA study programme is provided by a highly qualified and experienced staff consisting of 9 professors, 13 associate professors, and 20 lecturers (of which 9 hold a PhD degree). Several of the staff have received postdoctoral training abroad. The large number of teachers facilitates a very favourable teacher-to-student ratio. Most of the staff teaches also in the Biophysics Masters programme, and several in the Biochemistry BA/MA and/or Neurobiology BA/MA programmes as well.

During the site visit, the review panel had fruitful discussions with 11 professors/associate professors, and noticed that the teachers who represent different departments and the two faculties running the programme are all committed to the joint mission of delivering the teaching and developing the curriculum. The staff is actively engaged in high-level research and many of them lead national and international collaborative research projects, the latter funded by grants from EU or from Lithuanian-USA, -Taiwan, and -Norway cooperations. Research activity is seen also in publications, which include papers in internationally highly recognized journals.

Teaching and staff is supported by Vilnius University, which generally offers adequate conditions for the professional development of the teaching staff necessary for the provision of the programme. To a large extent, the professional development involves participation to workshops or national/international conferences. Sabbatical leaves, however, are considered impractical, mostly due to the heavy teaching duties (more than 300 hours/year for a full professor). The panel noted that support and incentives are mostly provided based on research quality and output rather than on the quality and quantity of teaching.

### ***2.4. Facilities and learning resources***

The first cycle study programme Biophysics is an interdisciplinary study programme focused on integration of biological and fundamental sciences. Accordingly, facilities and learning



resources of several core units of Vilnius University are used in the programme – the Faculty of Natural Sciences (hereinafter – FNS), the Faculty of Physics as well as the Faculty of Mathematics and Informatics, VU research institutes (Institute of Biochemistry and Institute of Biotechnology) and the National Cancer Institute. Students of the programme share the laboratories, auditoria and computer classes with students from other degree programmes, but because of the small number of students (within last 5 year period, average 14 student/ year) this apparently does not cause major problems and therefore the available equipment and workplace numbers are considered to be sufficient and adequate.

Although the programme is divided between physics and biology, FNS and its Department of Neurobiology and Biophysics provide the major part of teaching. Infrastructures of the faculty and the department have been substantially renovated using structural funds of EU and of national programmes. Common auditoria of the Faculty and laboratories have been renovated and updated and new research and teaching equipment has been purchased (SER Appendix 7). Because of these investments, the facilities are at an adequate level in terms of size and quality for successful implementation of the programme. Currently the Department is located in the old building of the University, but will move to new building of Life Science Centre by the end of next year. During the site visit, the review team had an opportunity to visit National Cancer Institute, a social partner of the programme. The Institute has established a modern and very well equipped laser and imaging laboratory, which is also used and available for the training of the biophysics students, working on their final theses.

The training of students in the programme involves development of computer skills and use of computerized practicals and simulation of living processes. Specialized computer rooms in FNS and in the Faculty of Physics provide good facilities for studies requiring computing and virtual learning environment. In FNS, the students have access to three computer classes, used for training and for examination. In addition, the Centre for Electronic Studies and Examination provides computer classes for examination of the programme students.

Practical placement of students to research projects is well-organized. An official list of practical placements, consisting of biophysical research projects to be carried out in the laboratories of the Department of Neurobiology and Biophysics, National Cancer Institute, and other Institutes of the University, is approved by the Dean of the FNS and offered to students. Overall, the programme provides appropriate for development and improvement of practical skills in the contexts of biophysical investigation.

VU Library is located at substantial distance from the FNS, however the Faculty has a subdivision of the library. SER contains no information on the availability of textbooks, but

during the site visit the review team learned that there is some shortage of the required textbooks, and lack or insufficient number of new textbooks. This unfortunate situation is partly corrected by the use of virtual learning environments and specific hand-outs prepared by teachers. Teaching staff of the programme also prepares electronic teaching materials, available on the website of the University. Most of the relevant scientific journals can be accessed, thanks to VU subscription to relevant databases, from any computer connected to the University network.

Altogether, the review panel finds that facilities and resources available to programme are adequate for the development of the students' theoretical and practical skills in the field of biophysics.

### ***2.5. Study process and students' performance assessment***

The admission of students to the programme is competitive and based mainly on the grades of School Leaving Examinations. The admission criteria and principles are clearly described and publicly available through the websites of the VU and The Lithuanian Higher Institutions Association for Organizing Joint Admission. Currently, the admission score includes the grades in Lithuanian language, physics, and biology as compulsory elements and chemistry and mathematics as elective ones. As the curriculum requires competence in both chemistry and mathematics, possibilities to further develop the admission criteria by including both in the score are worth exploring.

According to statistics (SER, p.22-23), the number of students admitted annually to the programme has been between 7 and 18 in the time period 2008-2013, and the level of competition measured as the ratio of applicants to admissions has varied in the range of 3.8 to 6.3, the toughest competition and the lowest number of admitted students both representing the latest student intake of 2013. In the same period, the number of graduates per year has remained roughly one fourth of the total number of students enrolled in the programme, indicating a low drop-out rate.

A wide repertoire of teaching methods are used, including lectures, seminars, and discussions and projects performed in groups, and more individual work like presentations and project work. Often the courses combine theory with practical or experimental work. Furthermore, the students are given good possibilities to do research practise in the laboratories of the units participating in the programme, and sometimes even be recruited as junior staff in projects supported by external funds. Students are also invited to research seminars. The early integration of students in research, starting already during the third semester, familiarizes the students with real-life biophysics and provides inspiration for the studies. The large number of scientific papers and

meeting presentations by the students (SER, Appendix 8) indicates a good scientific level in the research projects.

The programme and the University provide the students with adequate academic and social support. Individual consultations are available and the students receive help in finding suitable placements in research laboratories, including Professional Practise and Bachelor's thesis projects. There are scholarships for the best students, and social stipends are available for the ones with poor economy. There are four dedicated scholarships for this study programme, yearly awarded to the best students. Students are encouraged to participate in the international mobility programs like ERASMUS, and 11 programme students have used this opportunity in 2008-2012. According to the students, incompatible course contents with some universities have caused practical problems and perhaps limited the use of the possibilities available though ERASMUS.

The students' performance is assessed by diverse methods, often combining feedback and evaluation during the course with exam/exams as a summative assessment submitted for credit. However, some courses rely on just a single assessment, which may not always reflect the actual performance level of the student. Students are presented with the assessment schedule at the beginning of the course, but all relevant information including full course descriptions is not necessarily available online or can be outdated.

Most students continue their studies in the Masters programme and about one third already plans to go to PhD studies and to enter a career in science. Graduates of the programme appear to be highly searched for in the labor market, which speaks also for well-functioning study processes. As slight discrepancy is that the review team noticed that the students do not seem to be aware of the diversity of possibilities for biophysicists in the private and public sectors and therefore feel somewhat uncertain about future employment. Possibilities to invite alumni and potential employers to early bachelor – level courses to discuss and inform about perspectives on the job market should thus be explored.

## ***2.6. Programme management***

The management is distributed to several levels and organizations: students, teachers, Study Programme Committee (hereinafter – SPC), Department of Neurobiology and Biophysics, Faculty of Natural Sciences/Faculty of Physics. However, according to the information in SER and the discussions of the review team with the Dean of the Faculty of Physics, the Vice-Dean of Faculty of Natural Sciences, the SER group and the teachers of the programme, indicate that the main operative level responsibility for the programme management lies on the SPC, which has eight members including one student representative. The SPC steers the programme and manages the changes in courses or lecturers, but also takes care of several other tasks, including

organizing thesis defenses, helping students to find research projects, and providing and coordinating information on courses and curriculum. Consequently, the SPC appears as a modern and efficient operational structure for the management of the programme. On the site visit, it appeared, however, that the students are not well aware of the role and activities of the SPC. Inclusion of a private sector employer and improving the involvement of students would help make SPC an even better representative of the relevant stakeholders.

The programme collects feedback from the students, but the review team noticed that the feedback is obtained mostly from informal discussions with teachers rather than from systematic on-line student surveys organized each semester by the Quality Management Center of Vilnius University. The response rates to the official surveys are usually quite low, apparently because the students do not seem to recognize their value as a tool for the development of the study programmes. However, the feedback gathered from informal discussions is sporadic and incoherent by nature, and the currently used systematic survey protocols should be improved. Possibilities include adjustments in the questionnaires (designed together with students) and a more clear and visible communication on their importance.

The programme management has introduced several changes (see p. 7) to the curriculum prompted by previous evaluation, internal analyses, student feedback and trends in the labor market. These actions speak for a dynamic, reactive and proactive management.

### **III. RECOMMENDATIONS**

1. The expert panel strongly encourages the programme to further develop a clear and coherent vision towards modern biophysics. The panel is well aware of the institutional limitations; specifically, the thematic development of the programme is very much governed by the available teaching staff. The panel is also aware of ongoing and lively discussions of the future direction and focus of the programme. The panel would urge the SPC to spearhead this discussion and bring it to a timely conclusion.
2. The curriculum is presently slightly unbalanced and to correct the situation the programme should give some thought to increase the content of physics at the expense of biology. One possibility would be to make some biology courses elective (General Zoology, Basics of Botanic and Mycology, Plant Physiology), and to include compulsory courses on canonical fields of physics like mechanics, statistical mechanics/thermodynamics, electrodynamics, and quantum mechanics / molecular physics.
3. Teaching good scientific practice and bioethics should be included within the introductory courses.

4. Possibilities to invite alumni and potential employers to early BA courses to discuss and inform about perspectives on the job market for students should be explored.
5. Course descriptions and assessment criteria should be harmonized and more clearly communicated to students.
6. Communication between the SPC and the students and the awareness of the role of SPC among students should be improved.

#### **IV. SUMMARY**

The Biophysics Bachelor Programme fills an important gap, bridging the life sciences with physics and chemistry, and provides training which is essential in the cutting edge application of a broad range of biophysical techniques in the life and medical sciences. The job market offers bright prospects for biophysics graduates demonstrating that there is genuine need for this interdisciplinary programme.

The Biophysics Programme was formed from two programmes, one more biology based (neuroscience) and one more physics based. The resulting bipolarity is still clearly reflected in the curriculum, and two cultures live not yet fully united, which offers challenges but also opportunities for future development. The main challenge is to increase the weight of fundamental physics in the curriculum as a prerequisite for a sufficiently deep understanding of life processes. A second challenge, raised already in the previous evaluation, is to develop a more clear vision of modern biophysics.

The panel applauds the programme for being driven energetically by an impressive team of high quality teachers who conduct very visible science on a national and often European scale. The panel also was impressed by well-equipped laboratories and intensive collaborations with other research Institutions, which both enable students to carry out challenging research projects early in their careers.

Overall, the study processes are arranged in an efficient and supportive manner, as evidenced by the general satisfaction of the students and employers. There is some room for improvement in the practices of student assessment and provision of up-to-date course information.

The programme is managed by an active and effective Study Programme Committee (SPC), providing proved flexibility in adapting courses and research focus. A more active involvement of students would further improve the efficiency of SPC.

## V. GENERAL ASSESSMENT

The study programme *Biophysics* (state code – 612C72001) at Vilnius University is given **positive** evaluation.

*Study programme assessment in points by evaluation areas.*

No.	Evaluation Area	Evaluation of an area in points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	3
3.	Teaching staff	4
4.	Facilities and learning resources	4
5.	Study process and students' performance assessment	3
6.	Programme management	4
	<b>Total:</b>	<b>21</b>

\*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.

Grupės vadovas:  
Team leader:

Prof. dr. Kari Keinänen

Grupės nariai:  
Team members:

Prof. dr. Helmut Grubmüller

Doc. Bruno Cardinaud

Prof. dr. Laima Ivanovienė

Benas Gabrielis Urbonavičius

**VILNIAUS UNIVERSITETO PIRMOSIOS PAKOPOS STUDIJŲ PROGRAMOS  
BIOFIZIKA (VALSTYBINIS KODAS – 612C72001) 2014-12-01 EKSPERTINIO  
VERTINIMO IŠVADŲ NR. SV4-579 IŠRAŠAS**

&lt;...&gt;

**VI. APIBENDRINAMASIS ĮVERTINIMAS**

Vilniaus universiteto studijų programa *Biofizika* (valstybinis kodas – 612C72001) 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
	<b>Iš viso:</b>	<b>21</b>

\* 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)

&lt;...&gt;

**V. SANTRAUKA**

Biofizikos bakalauro programa užpildo reikšmingą spragą ir panaikina atotrūkį tarp gyvosios gamtos mokslų ir fizikos bei chemijos, taip pat suteikia žinių, kurios būtinos įvairiems pažangiausioms biofiziniams metodams taikyti gyvenime ir medicinos mokslų srityje. Darbo rinka siūlo puikias perspektyvas biofizikos absolventams; tai byloja apie tikrą šios tarpdisciplininės programos poreikį.

Biofizikos programa sudaryta iš dviejų programų: biologija grindžiamos programos (neurologija) ir fizika grindžiamos programos. Studijų programos sandarai vis dar būdingas bipoliškumas, ir du dalykai dar nėra visiškai sujungti, todėl ateityje laukia ne tik spęstiniai uždaviniai, bet ir tobulinimo galimybės. Pagrindinis uždavinys – studijų programoje padidinti fundamentinės fizikos reikšmę kaip prielaidą, būtiną pakankamai giliam gyvenimo procesų supratimui. Antrasis uždavinys, kuris keliamas jau ankstesnio vertinimo metu, yra sukurti aiškesnę šiuolaikinės biofizikos viziją.

Vertinimo grupė palankiai vertina programą dėl to, kad ją itin energingai įgyvendina įspūdinga aukšta mokymo kokybė pasižyminti dėstytojų grupė; jie vykdo akivaizdžią mokslinę veiklą ne tik nacionaliniu, bet dažnai ir Europos lygmeniu. Vertinimo grupei didelį įspūdį padarė ir puikiai įrengtos laboratorijos bei intensyvus bendradarbiavimas su kitomis mokslinių tyrimų institucijomis, nes tai sudaro sąlygas studentams vykdyti sudėtingus mokslinių tyrimų projektus pačioje jų karjeros pradžioje.

Apskritai studijų procesai organizuojami veiksmingai ir teikiama reikiama pagalba – tai rodo bendras studentų ir darbdavių pasitenkinimas. Dar būtų galima tobulinti studentų vertinimo praktiką ir atnaujintos informacijos apie studijų dalykus teikimą.

Programą valdo aktyviai ir efektyviai veikiantis Studijų programų komitetas (SPK), kuris užtikrina lankstumą derinant studijų dalykus ir mokslinių tyrimų veiklą. Aktyvesnis studentų dalyvavimas padėtų toliau didinti SPK veiklos efektyvumą.

<...>

### **III. REKOMENDACIJOS**

1. Vertinimo grupė primygtinai ragina užtikrinti, kad šia programa būtų toliau kuriama aiški ir nuosekli vizija, nukreipta į šiuolaikinę biofiziką. Vertinimo grupė gerai žino institucinius apribojimus; tiksliau, teminį programos plėtojimą stipriai nulemia dirbantys dėstytojai. Ekspertai taip pat žino apie vykstančias aktyvias diskusijas dėl būsimos programos krypties ir prioritetų. Todėl vertinimo grupė norėtų paraginti Studijų programos komitetą inicijuoti šias diskusijas ir laiku jas užbaigti;
2. Studijų programa šiuo metu yra šiek tiek nesubalansuota ir, siekiant ištaisyti padėtį, vertėtų apsvaistyti, ar reikėtų šiek tiek išplėsti fizikos turinį, o biologijos turinį susiaurinti. Viena galimybė būtų kai kuriuos biologijos dalykus nustatyti kaip pasirenkamuosius (Bendroji zoologija, Botanikos ir mikologijos pagrindai, Augalų fiziologija) ir įtraukti privalomus fizikos kanoninės srities dalykus, pavyzdžiui, mechaniką, statistinę mechaniką / termodinamiką, elektrodinamiką ir kvantinę mechaniką / molekulinę fiziką;



3. Gerosios mokslinės patirties ir bioetikos mokymas turėtų būti įtrauktas į įvadinius kursus;
4. Turėtų būti apsvarstytos galimybės pakviesti absolventus ir galimus darbdavius į ankstyvuosius verslo administravimo kursus, kuriuose būtų aptariamose studentų perspektyvas darbo rinkoje ir apie jas informuojama;
5. Kursų aprašymai ir vertinimo kriterijai turėtų būti suderinti bei aiškiau pateikti studentams;
6. Turėtų būti gerinama Studijų programos komiteto ir studentų komunikacija, taip pat didinamas studentų supratimas apie Studijų programos komiteto vaidmenį.

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