



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus universiteto

STUDIJŲ PROGRAMOS *BIOFIZIKA (621C72001)*

VERTINIMO IŠVADOS

**EVALUATION REPORT
OF *BIOPHYSICS (621C72001)***

STUDY PROGRAMME

at Vilnius University

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4. **Prof. dr. Laima Ivanovienė,** *academic,*
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Išvados parengtos anglų kalba
Report language - English

Vilnius
2014

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Biofizika</i>
Valstybinis kodas	621C72001
Studijų sritis	Biomedicinos mokslai
Studijų kryptis	Molekulinė biologija, biofizika ir biochemija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	antroji
Studijų forma (trukmė metais)	Nuolatinė (2)
Studijų programos apimtis kreditais	120
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Biofizikos magistras
Studijų programos įregistravimo data	2009-08-17

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Biophysics</i>
State code	621C72001
Study area	Biomedical Sciences
Study field	Molecular biology, biophysics and biochemistry
Type of the study programme	University studies
Study cycle	second
Study mode (length in years)	Full time (2)
Volume of the study programme in credits	120
Degree and (or) professional qualifications awarded	Master 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 (hereinafter – VU) is the biggest university of Lithuania with 23 core academic units, including 12 Faculties and two Institutes with Faculty Status. Since 1997, the second cycle study programme in Biophysics has been jointly administered by two faculties, Faculty of Natural Sciences and Faculty of Physics, and run by the Department of Neurobiology and Biophysics (Faculty of Natural Sciences), and the Department of Quantum Electronics (Faculty of Physics). The programme was evaluated last time in 2007 by national experts 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 programme was established 2002/2003 jointly between the Physics and the Neurobiology Departments. Resting upon the biophysics bachelor programme of the Department of Neurobiology and Biophysics, Faculty of Natural Sciences, it 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.

The high relevance of the programme to the economy and society is impressively underscored by that observation that during the review team's site visit many employers and potential employers clearly stated that there is real lack of biophysicists on the job market. They also confirmed that biophysics students specifically from this programme are very well prepared to join the labour market both in universities and research institutes, medical hospitals and health services, as well as in biotechnological, pharmaceutical and life science oriented companies. Interestingly, not all students seem to be fully aware of the many available career options. The panel concludes that the job market could absorb an about 50% increase of students within the programme, compared to the relatively low (7-12 students per year) current admission numbers. Many employers prefer biophysics students from Vilnius University, and the job perspectives and opportunities of the graduates are very diverse and bright. It is encouraging to see that about half of the graduates from the Masters programme proceed towards a PhD, and the other half typically finds good jobs in a broad and diverse range of occupations.

Considering the respective roles of the Bachelor and Masters programmes, it is clear that the bachelor level alone only provides a basic and general introduction into both the required physics concepts and biological systems background. For most career tracks it is very likely that an additional master's programme will be essential to cover the required fields in sufficient depth and width, which is especially crucial due to the high integration demands of the interdisciplinary programme.

To provide a coherent and high quality support and education for the best students and to prepare them for top positions in a broad range of fields is an expressed goal of the Masters programme. The clearly expressed and published aims and learning outcomes are therefore met by the programme. The name of the Masters programme, its learning outcomes, content and the qualification offered a compatible with each other.

On the strategic side, the strong life science focus of the programme, particularly on experimental design, methodology, data analysis, and complemented by the basic physics tools, implies a significant overlap and thus a strong competition with the biochemistry programmes.

The panel assumes that this focus originates from the traditional composition of the faculty rather than having been deliberately optimized. Accordingly, both teachers and students expressed that e.g., additional mathematics and physics is necessary and, in the absence of suitable courses, is presently acquired as self-study. The panel concludes that a shift of the center of mass of the programme towards physics would be beneficial.

2.2. Curriculum design

The students need to accumulate a total of 120 credits over a period of two years. The Master level Biophysics study programme is mostly designed for graduates from Bachelors programmes of Biophysics, Physics, Biology, Molecular Biology, Biochemistry, Bioengineering, and Bioinformatics. A considerable fraction of students joins the Masters Programme from outside of VU. The challenge of updating their background to the level provided by the Bachelor programme is met by considerable and sufficient support and self-studies. The admission to the studies is performed in both Faculties. Extent, character and inner structure of credits and contact hours of Master studies Biophysics programme match the normative acts of law and it is being implemented successfully.

With only 18 credits awarded for the elective courses, the Masters programme seems to be rather rigid, not reflecting the broad diversity of research directions and skills which are a clear strength of the programme. Further, and consistent with the review team's observations on the BA programme, little weight is given to the fundamental physics underpinning required for a full understanding of the relevant biophysical techniques. As an example, the quantum mechanics as far as relevant for biomolecular physics is taught rather late and is optional in the curriculum.

To this panel, it seems essential for the proper application of physics to life science questions that the canonical range of physics fields – mechanics, thermodynamics/statistical mechanics, electrodynamics and quantum mechanics (to an extent relevant for biomolecular physics and membrane physics) are understood at a fundamental level and beyond a merely application level. More weight should be given to teach these concepts in a continuous and harmonized way throughout the Bachelor and Masters programmes. Furthermore, the already adopted path of developing more (optional) specializations such as molecular biophysics, systems biophysics, cellular biophysics, structural molecular biophysics, or computer modeling should be continued. The panel is well aware that, because the programme rests on active and cutting edge research in the Faculties, which depends on external funding, maintenance of such continuity is a challenge.

The Masters thesis is an essential and central part of the studies. Project and research topics for Masters Theses are available in the Departments and on the web-site annually. The

procedures for finding and entering the Master Thesis project are perceived by the students as straight-forward, transparent and fair. Labs which combine mathematics and biology are highly appreciated. Students are required to do independent research in the field of biophysics and to defend the Master Thesis. The oral defense of the Thesis, very much like a mini-PhD defense, is seen very positively by the panel, as it allows probing in depth the level of in-depth understanding of the student. The Theses appear generally to be of high quality, probably reflecting also the excellent and intense supervision. Almost all Masters Theses were written in Lithuanian. The committee is aware that in principle, the use of English as the language of the Theses is currently possible, but in practice this does not seem to happen, even though the students clearly expressed their wish to write their theses in English.

The panel recognizes that, biophysics students seemed to be particularly flexible with a broad and analytical set of skills, which also qualifies them markedly above average for joining or founding new business. The bipolar nature of the programme, while criticized above, is also an asset of the programme as it is reflected in the diversity of skills and interests of the students applying to the job market. Overall, the students appeared to be happy with their situation and highly motivated. The expert panel was impressed by the nationwide high quality of the programme, which has great potential and a bright future.

2.3. Teaching staff

To bridge the apparent gap between fundamental physics and the life sciences is challenging, and requires considerable teaching effort and qualification of teaching staff. The panel felt that the involved faculties and teaching staff are very active and highly qualified in establishing a joint mission and curriculum. The high level of qualification ensures that the learning outcomes are achieved.

The teaching staff involves 10 professors, 6 associate professors and 4 lecturers holding PhD degree. 16 members of the teaching staff are permanent employees of Vilnius University; four members (professors) are invited lecturers from other institutions. With a nearly 1:1 teaching to student ratio, high quality supervision is provided. A remarkably large part of the teaching staff is actively engaged in high level international collaborations and activities, and an impressive number of prizes and awards have been received. Most professors pursue high quality research closely related to the overall scope of the biophysics programmes, publishing actively in national and international journals, and many of these are internationally highly recognized.

The average age of 60 for the full professors will be a challenge for the future development of the curriculum, but will offer considerable flexibility to meet the concerns phrased above. The

expert panel did not receive information on structural plans for future recruitments on the professor level.

Teaching 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. 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

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. Infrastructures of the involved VU faculties and institutes have recently been substantially renovated using structural funds of EU and funds of national programmes. Partly, this renovation is still going on in the Faculty of Physics. As a results, the size and quality of the auditoria, seminar rooms, research laboratories, library, etc., are more than adequate, especially regarding the small number of annually admitted students (10–18).

The teaching and learning in the programme utilizes laboratory investigations, computer-based modeling and virtual learning environment. In the Departments and Institutes involved in the programme, the students have access to a wide range of new and sophisticated scientific research equipment that can be used in the research projects and Master's Thesis studies (SER, p. 22). 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 available for the training of the biophysics students, working on their final theses.

Practical training of the students takes place in the research projects and Master's Thesis work. Lists of previously performed projects and instructions are available on the website of the Faculty of Physics. The projects are carried out in the research laboratories of the FNS (Dept. of Neurobiology and Biophysics), the Faculty of Physics (Dept. of Quantum Electronics) and in the research institutes, including the National Cancer Institute. The facilities and supervision for these activities appear excellent.

Library services are adequate. The students can borrow textbooks from the University Library and its specialized divisions placed in the different faculties. In addition to printed textbooks, the library provides access to e-books, databases and scientific journals. Recently, the

library of the Faculty of Physics moved to modern new premises in the National Open Access Scholarly Communication and Information Centre, and provides good working places and computer facilities for the students. Textbooks needed in the programme are available. Scientific journals relevant for biophysics studies can be accessed through ACM Digital Library, Cambridge Journals Online, Nature Publishing Group, Oxford Reference Online, Oxford University Press, Science Direct and etc. from any computer connected to 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 to the programme is competitive, requires a relevant Bachelor degree, and is based on the average grades during Bachelor studies and the grade of the Bachelor Thesis. Extra points are given for the scientific activities during the first cycle studies. The admission rules are clear and have been published.

Despite the recent reduction of state-funded places (to the current 10), the number of applicants has remained constant indicating that the programme is seen as attractive. Consistent with this, many applicants and admitted students come from other VU bachelor-level programmes than biophysics and from other Universities as well. The drop-out rate is quite low, below 20 %, speaking for successful and supportive study processes.

A wide repertoire of teaching and learning methods are used, which range from conventional lectures, seminars, and laboratory work to more student-driven and individual activities like discussions, presentations, and project work. As part of the Thesis work, the students get familiar with data analysis, scientific literature and writing, as is appropriate for Master's level studies. Student assessment is clear and transparent, follows VU rules, and employs a range of methods.

The programme and the University provide the students with adequate academic and social support. There are scholarships for the best students, and social stipends are available for the ones with poor economy, although information on these possibilities does not appear to reach all students. Students are encouraged to participate in mobility programs such as Erasmus. During the period 2008-2013, 11 students of the programme participated in Erasmus exchange scheme and 9 in Erasmus placements. The figures indicate commendable activity of the students and good compatibility with foreign study programmes. The students can get support and advice through individual consultations, which help in finding the laboratory and supervisors for the research projects and Master's Thesis work. The system of student placement to laboratories

encourages rotation which provides the students with a broader view on research techniques and possibilities.

Many students appeared to prefer English as the language of the Master's thesis, but felt that the current policy makes this difficult. The review team would recommend a more liberal attitude to the use of English. Fluency in professional English is required in the job market and a wider use English in the final theses would help in dissemination of the results and, more generally, in the internationalization of Lithuanian higher education.

A high percentage of students finishes the programme with honours reflecting a high level of motivation and also good supervision by the teaching staff. About half of the graduates continue to PhD studies, and the other half rest starts professional career in various positions in the private and public sectors, with an surprisingly good employment rate (of 100%!).

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 the 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 seven members including one student representative, and one representative of social partners (from VU Institute of Oncology). 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. Inclusion of a private sector employer 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 programme. 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 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 study programme committee 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. Thought should be given to strengthening the physics background in the canonical fields, e.g., by considering compulsory courses mechanics, statistical mechanics/thermodynamics, electrodynamics, and quantum mechanics / molecular physics.
3. The already adopted path of developing more (optional) specializations such as molecular biophysics, systems biophysics, cellular biophysics, structural molecular biophysics, or computer modeling should be continued.
4. Students should be encouraged to write their Theses in English.

IV. SUMMARY

Founded in cooperation between the neurobiology and physics departments, the Biophysics Master Programme aims at a coherent continuation of the Biophysics Bachelor programme, with a focus at providing the conceptual underpinning for a broad diversity of biophysics fields and modern techniques. This highly interdisciplinary programme thus serves to complement biological research and education with a solid fundamental understanding that is essential for the cutting edge application of a broad range of biophysical techniques in the life and medical sciences.

The expressed aims and learning outcomes position the programme well in preparing the students optimally for a very diverse and demanding job market and research fields of high relevance both for industry and society. Students with a Master in Biophysics at Vilnius

University are sought for nationwide by a diverse range of companies, and they are highly welcome for PhD programmes all over Europe. Indeed, the current demand seems to significantly exceed the current admission numbers.

From a curricular perspective, a wide and impressive selection of courses is offered, however with a strong focus in biology, which challenges a balanced distribution of learning outcomes and courses as would be appropriate from a sufficiently deep understanding of underlying physical concepts and techniques. In future attempts of harmonizing the Masters with the Bachelor Biophysics programme, this issue can and should be addressed in a coherent manner.

The panel applauds the programme for being driven energetically by an impressive time 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 Masters projects in a wide range of sub-fields and combinations thereof. The already adopted path of developing more (optional) specializations such as molecular biophysics, systems biophysics, cellular biophysics, structural molecular biophysics, or computer modeling should be continued.

Criteria for student performance assessment are transparent and accessible for the students. Teachers are encouraged to further harmonize their learning outcomes with the published documentation. Overall, the students expressed a very high level of satisfaction with the provided opportunities and support.

On the administrative level, the Study Programme Committee (SPC) is operational and effective on a regular basis, providing proved flexibility in adapting courses and research focus. The Programme has developed a culture of encouraging students to rotate between labs during their career, which broadens their perspectives and practical skills. A similar culture of encouraging students to write their Masters Thesis in English might be considered.

V. GENERAL ASSESSMENT

The study programme Biophysics (state code – 621C72001) 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	4
6.	Programme management	4
	Total:	22

*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 ANTROSIOS PAKOPOS STUDIJŲ PROGRAMOS
BIOFIZIKA (VALSTYBINIS KODAS – 621C72001) 2014-12-01 EKSPERTINIO
VERTINIMO IŠVADŲ NR. SV4-580 IŠRAŠAS**

<...>

VI. APIBENDRINAMASIS ĮVERTINIMAS

Vilniaus universiteto studijų programa *Biofizika* (valstybinis kodas – 621C72001) 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	4
6.	Programos vadyba	4
	Iš viso:	22

* 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)

<...>

V. SANTRAUKA

Biofizikos magistrantūros studijų programa, kuri sukurta bendradarbiaujant Neurobiologijos ir Fizikos fakultetams, siekiama nuosekliai tęsti Biofizikos bakalauro studijų programą, daugiausia dėmesio skiriant koncepciniam įvairiems biofizikos sričių ir šiuolaikiniams metodams stiprinti. Todėl šia tarpdisciplinine programa biologiniai moksliniai tyrimai ir švietimo veikla

papildoma tvirtomis esminėmis žiniomis, kurios būtinos, kad apskritai gyvenime ir medicinos mokslų srityje būtų taikomi pažangiausi įvairūs biofiziniai metodai.

Programoje išskelti tikslai ir studijų rezultatai padeda optimaliai parengti studentus itin įvairiai ir reikliai darbo rinkai bei mokslinių tyrimų sritims, kurios labai svarbios tiek pramonei, tiek visuomenei. Studentų, įgijusių Biofizikos magistro laipsnį Vilniaus universitete, ieško įvairios visos šalies bendrovės, jie itin laukiami visos Europos doktorantūros programose. Iš tikrųjų dabartinė paklausa, regis, smarkiai viršija dabartinio priėmimo į programą skaičių.

Vertinant studijų programos sandarą, siūlomas platus ir įspūdingas dalykų pasirinkimas, tačiau daug dėmesio skiriama biologijai, todėl kyla sunkumų dėl tolygaus studijų rezultatų ir dalykų paskirstymo, kuris būtų tikslingas atsižvelgiant į pakankamai gilų pagrindinių fizikos koncepcijų ir metodų supratimą. Ateityje mėginant suderinti Biofizikos magistrantūros ir bakalauro studijų programas, šis klausimas gali ir turėtų būti sprendžiamas nuosekliai.

Vertinimo grupė palankiai vertina programą dėl to, kad ją itin energingai įgyvendina įspūdinga aukštos mokymo kokybės dėstytojų grupė; jie vykdo labai matomą mokslinę veiklą nacionaliniu ir dažnai 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 magistro projektus įvairiose srityse ir jų posrityse. Turėtų būti toliau plėtojama jau pasirinkta kryptis įtraukti daugiau (pasirenkamųjų) specializacijų, tokių kaip molekulinė biofizika, sistemų biofizika, ląstelės biofizika, struktūrinė molekulinė biofizika arba kompiuterinis modeliavimas.

Studentų vertinimo sistemos kriterijai yra skaidrūs ir prieinami studentams. Dėstytojais skatinami toliau derinti studijų rezultatus su skelbiamais dokumentais. Apskritai studentai rodė labai didelį pasitenkinimą dėl teikiamų galimybių ir paramos.

Administraciniu lygmeniu Studijų programos komitetas (SPK) veikia efektyviai ir reguliariai, užtikrindamas lankstumą derinant studijų dalykus ir mokslinių tyrimų veiklą. Įgyvendinant šią programą puoselėjama kultūra, kuria skatinama studentų rotacija laboratorijose, ir tai jų praplečia perspektyvas bei gerina praktinius įgūdžius. Galėtų būti apsvarstyta panaši galimybė skatinti studentus magistro baigiamuosius darbus rašyti anglų kalba.

<...>

III. REKOMENDACIJOS

1. Vertinimo grupė primygtinai ragina Studijų programos komitetą toliau plėtoti aiškia ir nuoseklią viziją, nukreiptą į šiuolaikinę biofiziką. Ekspertai gerai žino apie institucinius apribojimus; tiksliau, teminį programos plėtojimą stipriai nulemia dirbantys dėstytojai.

Vertinimo grupė taip pat žino apie vykstančias aktyvias diskusijas dėl būsimos programos krypties ir prioritetų. Ekspertų grupė ragina Studijų programos komitetą inicijuoti šias diskusijas ir laiku jas užbaigti;

2. Turėtų būti apsvarstyta galimybė stiprinti fizikos pagrindus kanoninėse srityse, pavyzdžiui, įvedant privalomus dalykus: mechaniką, statistinę mechaniką / termodinamiką, elektrodinamiką ir kvantinę mechaniką / molekulinę fiziką;
3. Turėtų būti toliau plėtojama jau pasirinkta kryptis įvesti daugiau (pasirenkamų) specializacijų, tokių kaip molekulinė biofizika, sistemų biofizika, ląstelės biofizika, struktūrinė molekulinė biofizika arba kompiuterinis modeliavimas;
4. Studentai turėtų būti skatinami rašyti baigiamuosius darbus anglų kalba.

<...>
