



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vytauto Didžiojo universiteto
STUDIJŲ PROGRAMOS *BIOTECHNOLOGIJA*
(valstybinis kodas – 612J70002)
VERTINIMO IŠVADOS

EVALUATION REPORT
OF *BIOTECHNOLOGY* (state code – 612J70002)
STUDY PROGRAMME
At Vytautas Magnus University

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Išvados parengtos anglų kalba
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DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Biotechnologija</i>
Valstybinis kodas	612J70002
Studijų sritis	Technologijos mokslai
Studijų kryptis	Biotechnologijos
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (4)
Studijų programos apimtis kreditais	240 ECTS
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Biotechnologijos bakalauras
Studijų programos įregistravimo data	Lietuvos Respublikos švietimo ir mokslo ministro 2011 m. rugpjūčio 22 d. įsakymu Nr. SR-3931.

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Biotechnology</i>
State code	612J70002
Study area	Technological Sciences
Study field	Biotechnology
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 ECTS
Degree and (or) professional qualifications awarded	Bachelor of Biotechnology
Date of registration of the study programme	22 nd August 2011, under the Order of the Minister of the Ministry for Education and Science of the Republic of Lithuania No. SR-3931.

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CONTENTS

I. INTRODUCTION	4
1.1. Background of evaluation process.....	4
1.2. General.....	4
1.3. Background of the HEI/Faculty/Study field/Additional information.....	4
1.4. The Review Panel.....	6
II. PROGRAMME ANALYSIS	7
2.1. Programme aims and learning outcomes.....	7
2.2. Curriculum design	8
2.3. Teaching staff	10
2.4. Facilities and learning resources	11
2.5. Study process and students' performance assessment.....	12
2.6. Programme management	14
III. RECOMMENDATIONS	16
IV. SUMMARY.....	17
V. GENERAL ASSESSMENT	18

I. INTRODUCTION

1.1. Background of evaluation process

The evaluation of on-going study programmes is based on the **Methodology for Evaluation of Higher Education Study Programmes**, approved by the Order No 1-01-162 of 20th December 2010 of the Director of the Centre for Quality Assessment in Higher Education (hereafter, SKVC). 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 the Self-evaluation Report prepared by a Higher Education Institution (hereafter, the HEI); 2) a visit of the Review Panel at the higher education institution; 3) preparation of the evaluation report by the Review Panel and its publication; 4) follow-up activities.*

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

The programme is **accredited for 6 years** if all evaluation areas were 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 SKVC.

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

The external evaluation procedures of the Bachelor in *Biotechnology* degree at Vytautas Magnus University in Kaunas, Lithuania were organized by the Centre for Quality Assessment in Higher Education of Lithuania.

For the evaluation, the following documents were used:

1. Law on Higher Education and Research of Republic of Lithuania;
2. Principles and Procedures for the External Evaluation and Accreditation of Study Programmes;
3. Methodology for Evaluation of Higher Education Study Programmes;
4. Order of the Minister for Education and Science of the Republic of Lithuania approving the General Requirements of the First Degree and Integrated Study Programmes;
5. Order of the Minister of Education and Science of the Republic of Lithuania on approval of the Descriptor of Study Cycles.

The basis for the evaluation of the study programme are the Self-Evaluation Report (hereafter, referred to as the SER) prepared in January 2016, its annexes and the site visit of the Review Panel to Vytautas Magnus University on Tuesday 10th of May 2016. The site visit included meetings with the administrative staff of the University; staff responsible for preparing the SER; teaching staff; students currently on the programme as well as social partners and employers. The alumni of the programme were not yet available as the first students graduate from the programme this year (2016). The Review Panel evaluated various teaching resources: classrooms, laboratories, library, computer facilities and examined a sample of students' Practice Reports – the final theses were not yet available. After the Review Panel discussions and the additional preparation of conclusions and remarks, preliminary general conclusions of the visit were presented to the community of the University. After the site visit, the Review Panel met to discuss and agree the content of their final report, which represents the views of the Panel.

The review of the programme took place in the context of the following statement presented in the SER: “The Biotechnology Bachelor program at VMU is designed to train the qualified specialists with research skills who can successfully work in research and practice of science, technology, business and social areas or systems”.

The degree programme is a four-year full-time programme providing the Bachelor of Biotechnology. The Department responsible for the programme is the Department of Biology at the Faculty of Natural Sciences. The programme was registered on September 15th 2011 and the first admission of students was in 2012. The programme was evaluated in 2013 providing 3-year accreditation (until June 30th, 2016).

1.4. The Review Panel

The Review Panel was composed according to the *Description of the Review Team Member Recruitment*, approved by the Order No 1-01-151, 11/11/2011 of the Director of the Centre for Quality Assessment in Higher Education. The site visit to the HEI was conducted by the Panel on 10/05/2016.

1. Prof. Halina Gabryś (Chair of the Team)

Professor at Jagiellonian University, Poland.

2. Prof. Ruth Shimmo

Professor at Tallinn University, Estonia.

3. Assoc. Prof. Niels Thomas Eriksen

Associate Professor at Aalborg University, Denmark.

4. Mr Julius Gagilas

Managing Director at JSC "Diagnolita", Lithuania.

5. Ms Vaida Šidlauskaitė

Doctorate candidate at Lithuanian Sports University (Biology field), Lithuania.

II. PROGRAMME ANALYSIS

2.1. Programme aims and learning outcomes

The way the programme aims are presented in the SER is a bit confusing: in addition to the aims there is also a “Purpose”, at the same time the intended learning outcomes in the SER are overlapping with the aims. However, this weakness is formal and can be easily corrected by changing some terms. Annex P2 of the SER offers an additional set of more detailed intended learning outcomes of the programme. The Aim/Purpose of the programme is “*to prepare competitive, qualified biotechnology professionals with the knowledge and skills of classic and modern chemistry, physics, biology, biochemistry and other basic sciences as well as applied biotechnology subjects (bioinformatics, plant, animal, pharmaceutical, and molecular biotechnology), which are required for application of biotechnology in the practical and professional activities, in creating new products and technologies, starting their own business or for pursuing further studies*”. The aim is comprehensive, detailed and well-compatible with the type and level of qualifications offered. Information about the study programme is publicly available (also in English) on VMU website: <http://www.vdu.lt/lt/study/program/show/202/>.

The described aims and the intended learning outcomes are seen to meet both the needs of Lithuania and the rest of Europe, as revealed by the survey of Lithuanian biotechnology enterprises covering the period of 2007-2015, which identified a growing demand for trained biotechnology specialists. Only in 2014, the revenue of the European biotech industry grew by 15% (“Beyond borders: Reaching new heights.” Biotechnology Industry Report 2015. Ernst & Young, [http://www.ey.com/Publication/vwLUAssets/EY-beyond-borders-2015/\\$FILE/EY-beyond-borders-2015.pdf](http://www.ey.com/Publication/vwLUAssets/EY-beyond-borders-2015/$FILE/EY-beyond-borders-2015.pdf)).

The feasibility studies made in Lithuania and international market, as well as job trends demonstrate the increasing need for specialists in biotechnology. The intended learning outcomes of the programme are defined based on international and local directives (Level 6 of the National and European Qualification Framework).

The intended learning outcomes of the programme are described in great details in the SER (p. 8, Annex 2) revealing that all the main components, knowledge, skills and competences, which need to be present in a Biotechnology study programme (according to Level 6 of the National and European Qualification Framework) – are present. The critics made during the previous external evaluation in 2013 have been responded to and the intended learning outcomes related to “process engineering” have been included into the programme. Now the scope of the

programme aims and intended learning outcomes is more focused on Biotechnology.

Overall, it may be said that the programme aims and the intended learning outcomes are detailed and to a great extent compatible with each other. They are also compatible with the programme content and with type and level of qualifications offered.

2.2. Curriculum design

The legal requirements (approved under the Order of the Minister of Education and Science of April 9th, 2010, No. V-501¹) of the first cycle study programme are met:

- a) Study field subjects should make at least 165 ECTS (currently on the programme are 171 ECTS);
- b) General university study subjects should be no less than 15 ECTS (currently on the programme are 39 ECTS);
- c) Practice and internship should make at least 15 ECTS (currently on the programme are 15 ECTS);
- d) Final thesis (project) should be allocated at least 12 ECTS (currently on the programme are 15 ECTS);
- e) Freely chosen subjects should comprise no more than 60 ECTS (currently on the programme are around 40 ECTS).

While it is clear that the legal requirements are met, the Review Panel suggests that the volume of general university study subjects be decreased and the amount of technology-related subjects increased instead.

The volume of the analysed study programme is 240 ECTS, the credits are distributed relatively evenly: 28-32 ECTS on each term.

During the first year of study (I-II semesters) the students acquire knowledge in Mathematics, Physics, Chemistry, and Biology. They start studying general engineering subjects like *Bionics and Bioengineering* (I sem.) and *General Engineering and Electronics* (IV sem.). During the second year *General Biotechnology* and *Instrumental Analysis* are taught (III–IV sem.).

During the third and fourth years subjects of Special Study Group are studied. The subjects of General Education Group are studied almost throughout the whole 4-year period (from I until

¹ Order of the Minister for Education and Science of the Republic of Lithuania “General Requirements of First Degree and Integrated Study Programmes”.

VII semester).

Compared to the situation during the previous external evaluation there is now more emphasis on the engineering aspects of biotechnology in the programme and new study subjects like *Industrial Biotechnology* and *Design of Biotechnological Processes and Plants* have been included. This trend should be continued and the volume of study subjects teaching analytics and biotechnological processes should be further increased. Also both basic lab skills and creativity (integrating knowledge from different disciplines, e.g. optics and biology) could be further improved. From the site visit the Review Panel learned that a new study subject to teach *Good Laboratory Practice* is under process in cooperation with social partners. The cooperation between industry and the *Biotechnology* programme should be further encouraged.

Notable emphasis is on the students' individual work (as stated both in the SER and revealed during the discussions in the site visit). About 60% of the workload for all the study subjects in the programme is dedicated to individual work. This raises a question if the ambitious aims are achievable with extensive individual work. On the other hand, the students assured during the site visit that the teachers are well achievable if advise/supervision is needed. In addition there is a well-functioning mentor system at work.

There are no significant overlaps in the study subjects but rather a constructive overlapping which brings the students to a new level. This was supported by student interviews during the site visit.

The content of the majority of study subjects is up-to-date. Most of the teachers are deeply involved into research, which ensures that the latest research is present in their teaching and student supervision. They are expected to update the lectures once a year – if they fail to do it, the students will provide feedback. The involvement with industry also helps to keep the students aware of the latest achievements in the field. The social partners offer the possibility for practices in different companies, they act as co-supervisors and offer also a feedback to teachers in order to improve the study programme.

2.3. Teaching staff

The teaching staff that provides the study programme fulfils legal requirements². 27% of study field subjects are taught by professors, 33% by associate professors and 40% by lecturers. Over 80% of 49 teachers are employed full-time. According to the SER, the teachers have an average teaching experience of 12 years. Closer analysis shows that 10 persons have a very long teaching experience of 20 or more years, while 18 persons' experience is shorter than 10 years and among them 3 teachers have just started their career in education (since 1 year). The less experienced teachers have, however, much longer research experience.

The staff turnover is moderate and does not perturb the programme implementation: 5 teachers of the study field subjects have quit (most because of retirement) while 8 new teachers have been hired since the last external evaluation. Additionally 7 part-time technicians and 2 engineers provide technical help for researchers and students. The number of the teaching staff: 13 professors, 16 associate professors and 20 lecturers is fully adequate to ensure the achievement of the intended learning outcomes.

According to p. 40 of the SER, the teaching staff are employed in the process of public competition. Candidates selected by the Department of Biology are approved by the Faculty of Natural Sciences Council and Vytautas Magnus University Senate. This procedure certainly secures high quality of the teaching staff; indeed, four Lithuanian Science Prize laureates and 3 members of the Lithuanian Academy of Sciences are among the teachers of *Biotechnology* study programme. During last 5 years the programme teachers published over 50 papers in journals indexed in the ISI Journal list and over 100 papers in other peer-reviewed journals. The scientific activity of the teachers is also reflected in a high number of grant proposals prepared, and funding obtained. In the evaluation period the teachers participated in more than 10 international projects and 20 projects supported by Lithuanian foundations and industrial partners.

Vytautas Magnus University administration introduced a system motivating teachers to take part in scientific and public (e.g. expert) activities and to improve their qualifications. The system grants premiums to persons with a documented high level of the above listed activities. The teachers take part in numerous courses organized by the University, mostly connected with educational work and focused on introducing new teaching methods. Each year up to 20% of the programme teachers deliver series of lectures abroad within the frame of Erasmus+ programme

² Order of the Minister for Education and Science of the Republic of Lithuania "General Requirements of First Degree and Integrated Study Programmes".

or other exchange agreements. Participation in international projects is also beneficial for raising professional, educational and research qualifications. In the field of international cooperation short visits, meetings and seminars prevail and very few teachers included a longer internship abroad in their CV. The reasons, according to discussions conducted during the site visit, are the lack of financial support and too high teaching workload, preventing teachers to profit from this form of improving their skills, the form particularly important for younger staff working in the rapidly developing field of Biotechnology.

Most teachers are active researchers in the area of taught subjects or close enough to these subjects, which creates proper conditions for reaching the aims and the intended learning outcomes. However, the system used in the SER for listing the publications is unnecessarily complicated and impedes a deeper analysis of the conformity between research and educational activities of the particular staff members.

So far, very few partners from industry and/or foreign scientists delivered lectures for the students of the evaluated programme. This form of teaching activity has evidently been introduced only recently and needs reinforcement, especially as it has been suggested in the former evaluation report issued in 2013.

The teachers' workload as it was indicated previously is very high (e.g. 450 contact hours for a professor, supervision of a PhD student credits 40 h; tutoring a bachelor student credits 6 h). Reducing the teaching workload and shifting the balance towards research would be very profitable for implementation of programme aims and it would enable teachers to invest more time into raising their qualifications. This possibility is very important in rapidly developing and constantly changing fields to which Biotechnology certainly belongs.

2.4. Facilities and learning resources

After the previous external evaluation the premises in terms of laboratory space have been improved. There are a number of new laboratories: Molecular Biology & Gene Engineering Laboratory including DNA/RNA extraction room and PCR rooms, two phyto chambers and a number of new laboratories in Vytautas Magnus University Botanical Garden including Bioreactor Laboratory and General and Plant Biotechnology Laboratory. The Genetics and Immunology Laboratory and Biophysics and Bionanotechnology Laboratory were recently renovated. The improvements in terms of laboratory space need to continue as many laboratories are still too small and would need to be more spacious to accommodate the student groups.

The instruments and other equipment are available also for students who carry out their practical work. Part of the equipment has been upgraded since the previous external evaluation (inverted microscope Nikon Eclipse, horizontal flow laminar hood). In addition, a new bioreactor (most likely, Applikon MiniBio 250, for General and Plant Biotechnology Lab) is expected to arrive in the near future.

The instruments in the laboratories include High Performance Liquid Chromatographs, Mass Spectrometers, Capillary Electrophoresis etc. Interesting projects, which combine analytical chemistry with engineering are going on (miniturization, portable instruments) making the student research opportunities promising.

The possibilities for students' practice are offered from various companies and students perform these often during their summer vacation.

The Informatics and Natural Sciences Library is available with a number of computers for students and on-line access to journals. Various learning materials are offered: printed documents, databases, access to documents in the Lithuanian Academic Electronic Library (eLABa). The study material for subjects in Biotechnology study programme is partly electronic, freely available for Faculty students. Main textbooks, among them those published by the teachers of the Faculty of Natural Sciences, are available for lending in the Library. However, while visiting the library, the Review Panel felt that basic textbooks in the field of Biotechnology was available in a rather limited number of copies, so there should be a further increase in the availability of these textbooks.

2.5. Study process and students' performance assessment

The admission requirements are clear, detailed, in accordance to national procedures and based on weighed grade averages from selected subjects (Mathematics and Chemistry for the students who plan to enter Biotechnology programmes). The admission requirements and procedures are described on the University website in Lithuanian, English and Russian.

Student enrolment number statistics provided in the SER shows that stable numbers of students are registered every year; during the last three years from 2012 to 2015 these were 73, 70 and 72 (the SER, table 11). The popularity of the programme is influenced by marketing activities of the Vytautas Magnus University. An extensive list of marketing activities is described in the SER, paragraphs 81-85. A movie about *Biotechnology* programme is presented on the University website (<http://www.vdu.lt/lt/study/program/show/202/>).

The organisation of the study programme (shown in the Table 5 of the SER) provides a natural progression of study subjects. The study programme also ensures that students are introduced to the broad spectrum of knowledge based intended learning outcomes, described in Table 3 of the SER. The study programme allows students to make individual study plans and select different study subjects in order to motivate them to acquire knowledge in the selected areas. Information on the study subjects is sufficient and the rules of the subject selection are clear for the students. The depth of knowledge is, however, difficult to assess and it is less clear how the skill based intended learning outcomes, especially those related to practical work in the laboratory and those related to manufacturing are attained. Many practical teaching methods include observation, laboratories are rather small – accordingly not in all cases the students can have enough hands-on practice. It would be beneficial to organize the practical training in ways that students could get more practical experience, for example in smaller groups.

Students are encouraged to participate in research and applied research activities. In their bachelor projects the students have to provide their own research data. Students have also the opportunity to take part in conferences where they present the results of their own research. The study programme includes practices on 3rd and 4th year that allow students to collaborate with companies, however most of the research is done in the Faculty and only few students do research in other institutions. Social partners could be more involved in student's practical training process.

Students have good opportunities to participate in student mobility programmes. The University collaborates with 52 foreign universities, and 25 *Biotechnology* programme students have made use of the exchange programmes in the evaluated period. In the SER paragraph 97 is stated that Vytautas Magnus University is one of the most active universities in Lithuania regarding student exchange programmes. The mostly used mobility programme is Erasmus+. Students are more active in Erasmus+ exchange than teachers. The Erasmus+ programme is evaluated positively by the students. Faculty of Natural Sciences every year accepts 2-5 international exchange students. The programme has also accepted international exchange students.

The University ensures an adequate level of academic as well as social support. Students have good contacts to the teaching staff. Teachers are easily reached for academic or social reasons and they are very motivated to help the students. Different communication channels are used between students and teachers, including the Internet website, bulletin boards, online facilities, periodical meetings, face to face consulting, Skype, e-mails. Academic support is also ensured

by a high number of staff members as compared to student numbers. The evaluation procedures employed at the different study subjects also encourage the academic support from the teachers.

The assessment system for students is described in detail in the SER and on the University website. The assessment of study subjects is explained on the first lectures and consists of an exam, a mid-term exam, and assessment of practical work. In general the results look consistent and positive among different year students.

The programme is too “young” yet to have data on the performance of its graduates. The first students will graduate in 2016.

The social partners and the group responsible for the preparation of the SER see that there are many local job opportunities within the Biotechnology sector. Most students feel confident that they will be able to get the job.

2.6. Programme management

The programme is administered by the Study Programme Committee, including staff, students, and external experts. The programme is managed by an experienced staff member. The Manager (also mentioned as Coordinator in the SER) is responsible to the Study Programme Committee. The programme seems well managed and students are acquainted with the Manager, they are satisfied with the management, and appear to be generally well informed.

Vytautas Magnus University has an institutional quality assurance system and a programme specific quality assurance system composed of the Study Programme Committee, Head of the Department and Faculty members. The Study Programme Committee makes evaluations of the study subjects based on a self-evaluation document prepared by the Department of Biology at the end of each semester. Every second year, the programme is taken through the evaluation based on self-evaluation reports and other inputs.

The Study Programme Committee has, in collaboration with the Department of Biology, the responsibility for the update of the programme, and these are therefore the same persons who are responsible for the assessment of the programme and its updates.

External evaluations are used to improve the programme, and the SER includes a comprehensive list of changes made after the last evaluation. Laboratories have been renewed and more teachers have been employed as student numbers have increased. Recommendations in the previous external evaluation from 2013 also stated that ‘the study program could be complemented by

more applied aspects of biotechnology' and 'Engineering aspects of biotechnology should have priority'. This has led to the inclusion of novel study subjects in these areas, but both areas should still be stronger represented in the study programme. Applied/engineering aspects of Biotechnology are also not strongly involved in research topics at Vytautas Magnus University (were mentioned as a research topic by only one of the teachers the Review Panel met during the site visit). The managers of the programme reported that it is difficult to find skilled teachers in this area. The suggestion of the Review Panel is to encourage the shift of research towards Biotechnology through closer cooperation with social partners and other universities.

Opinions from external stakeholders are taken into consideration. It is not fully clear if this is done in a formally organised way, but social partners are the members of the Study Programme Committee.

The internal quality assurance procedures are quite extensive and the University is investing a substantial amount of resources in this area. Based on the meetings with students and staff, the quality assurance procedures seem to be effective.

III. RECOMMENDATIONS

1. The volume of study subjects teaching analytics and biotechnological processes should be further increased. Also both basic laboratory and creativity skills (integrating knowledge from different disciplines, e.g. optics and biology) should be improved.
2. Reducing the teaching workload for staff and shifting the balance towards research would be very helpful for implementation of the programme aims and it would enable teachers to invest more time into improving their qualifications. This possibility is very important in rapidly developing and constantly changing fields to which Biotechnology certainly belongs.
3. The improvement in terms of laboratory space needs to continue, as many laboratories are still too small and would need to be more spacious to accommodate the student groups.
4. It would be beneficial to organize the practical training in a way that students could get more practical experience, for example smaller groups for laboratory work or more equipment dedicated to laboratory work.
5. Social partners could be more involved in student's practical training process. Collaborations with social partners could be increased to allow more students to get the experience with industry.
6. The shift of research towards biotechnology through closer cooperation with social partners and other universities should be encouraged.

IV. SUMMARY

The programme has been improved since the last external evaluation – there is now clearly more emphasis on the engineering aspects of Biotechnology in the programme. The tendency should continue and the volume of study subjects teaching analytics and biotechnological processes should further increase.

The aims and the intended learning outcomes are compatible with each other and reflect the needs of the labour market in Lithuania and in Europe. However, the way the aims and the intended learning outcomes are presented (e.g. in the SER) should be better structured.

The teaching staff of the programme fulfils the legal requirements, they are very dedicated to their job and they are highly valued by the students. However, the teachers' workload is very high. Shifting the balance towards research would be very profitable for implementation of programme aims and would enable teachers to invest more time into raising their qualifications.

After the previous external evaluation the premises in terms of laboratory space have been improved. New laboratories have been created and others have been renovated. The students have access to the research equipment and are involved into interesting projects (i.e. combining analytical chemistry with engineering). The improvements in terms of laboratory space need to continue, as many workrooms are still too small.

The organisation of the study programme provides a natural progression of study subjects and ensures that students are introduced to a broad spectrum of knowledge based intended learning outcomes. It would be beneficial to organize the practical training in way that students could get more hands-on practice. Social partners could be more involved in student's practical training process. The University ensures an adequate level of academic as well as social support. Students evaluate very positively their participation in the Erasmus+ programme.

The programme appears well managed and students are satisfied with the management. The Review Panel finds the idea of electing the last year students' as mentors who help first year students to navigate through the programme a very good initiative.

V. GENERAL ASSESSMENT

The study programme *Biotechnology* (state code – 612J70002) at Vytautas Magnus University is given a 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	3
4.	Facilities and learning resources	3
5.	Study process and students' performance assessment	3
6.	Programme management	3
	Total:	18

*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. Halina Gabrys
Grupės nariai: Team members:	Prof. Ruth Shimmo
	Assoc. Prof. Niels Thomas Eriksen
	Mr Julius Gagilas
	Ms Vaida Šidlauskaitė

**VYTAUTO DIDŽIOJO UNIVERSITETO PIRMOSIOS PAKOPOS STUDIJŲ
PROGRAMOS *BIOTECHNOLOGIJA* (VALSTYBINIS KODAS – 612J70002) 2016
RUGPJŪČIO 23 D. EKSPERTINIO VERTINIMO IŠVADŲ NR. SV4-199 IŠRAŠAS.**

<...>

V. APIBENDRINAMASIS ĮVERTINIMAS

Vytauto Didžiojo universiteto studijų programa *Biotechnologija* (valstybinis kodas – 612J70002) vertinama **teigiamai**.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	3
2.	Programos sandara	3
3.	Personalas	3
4.	Materialieji ištekliai	3
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	3
	Iš viso:	18

* 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

Studijų programa *Biotechnologija* nuo paskutiniojo išorinio vertinimo patobulinta – dabar šioje programoje akivaizdžiai labiau akcentuojami biotechnologijos inžinerijos aspektai. Ši tendencija turėtų būti tęsiama, ir toliau turėtų būti didinama analizės bei biotechnologinių procesų mokymui skirtų studijų dalykų apimtis.

Programos tikslai ir numatomi studijų rezultatai dera tarpusavyje ir atspindi Lietuvos bei Europos darbo rinkų poreikius. Tačiau tikslų ir numatomų studijų rezultatų pateikimo (pvz., savianalizės suvestinėje) būdas turėtų būti labiau struktūrinis.

Šios programos dėstytojai atitinka teisės aktų reikalavimus. Jie labai atsidavę savo darbui, juos palankiai vertina studentai. Tačiau dėstytojų darbo krūvis yra labai didelis. Jei daugiau šio krūvio valandų būtų skiriama moksliniams tyrimams, būtų lengviau įgyvendinti šios programos tikslus, be to, dėstytojai turėtų laiko kelti savo kvalifikaciją.

Po ankstesnio išorės vertinimo patalpos, turint omenyje laboratorijoms skirtą plotą, pagerėjo. Atsirado naujų laboratorijų, kitos renovuotos. Studentai gali naudotis mokslinių tyrimų įranga, jie dalyvauja įdomiuose projektuose (sujungiančiuose analitinę chemiją ir inžineriją). Laboratorijų erdvę reikia ir toliau didinti, nes daugelis darbo kambarių vis dar yra per maži.

Šios studijų programos organizavimas užtikrina natūralią studijų dalykų seką ir užtikrina, kad studentai bus supažindinti su plataus spektro žiniomis pagrįstais numatomais studijų rezultatais. Būtų naudinga, jei praktinis mokymas būtų organizuojamas taip, kad studentai galėtų įgyti daugiau praktinės patirties. Socialiniai partneriai galėtų aktyviau dalyvauti studentų praktinio mokymo procese. Universitetas užtikrina tinkamo lygio akademinę ir socialinę pagalbą. Studentai labai teigiamai vertina savo dalyvavimą *Erasmus+* programoje.

Šio studijų programos vadyba, atrodo, yra gera, studentai ją vertina palankiai. Labai gera iniciatyva vertinimo grupė laiko idėją paskutiniojo kurso studentus skirti mentoriais, kurie padės pirmakursiams orientuotis šioje programoje.

<...>

III. REKOMENDACIJOS

1. Reikėtų toliau didinti analizės ir biotechnologinių procesų mokymui skirtų studijų dalykų apimtį. Be to, reikėtų didinti pagrindinius laboratorinio darbo ir kūrybiškumo gebėjimus (integruojant įvairių disciplinų žinias, pvz., optikos ir biologijos).
2. Reikėtų sumažinti dėstytojų darbo krūvį ir daugiau laiko skirti moksliniams tyrimams, nes tai padėtų įgyvendinti šios studijų programos tikslus, be to, dėstytojams liktų daugiau laiko kelti savo kvalifikaciją. Ši galimybė labai svarbi sparčiai besivystančiuose ir nuolat kintančiuose srityse, kurioms, be abejo, priklauso biotechnologija.
3. Reikia ir toliau plėsti laboratorijų erdvę, kadangi daugelis laboratorijų vis dar yra per mažos, o turėtų būti erdvesnės, kad jose tilptų studentų grupės.

4. Praktinį mokymą būtų naudinga organizuoti taip, kad studentai galėtų gauti daugiau praktinės patirties, pavyzdžiui, laboratorinį darbą studentai galėtų atlikti mažesnėmis grupėmis arba laboratoriniams darbui galėtų būti skiriama įrangos.
5. Socialiniai partneriai galėtų aktyviau dalyvauti studentų praktinio mokymo procese. Bendradarbiavimą su socialiniais partneriais būtų galima plėsti, kad daugiau studentų turėtų galimybę įgyti patirties pramonės sektoriuje.
6. Reikėtų skatinti mokslinių tyrimų persikėlimą į biotechnologijos sritį glaudžiai bendradarbiaujant su socialiniais partneriais ir kitais universitetais.

<...>

Paslaugos teikėjas patvirtina, jog yra susipažinęs su Lietuvos Respublikos baudžiamojo kodekso 235 straipsnio, numatančio atsakomybę už melagingą ar žinomai neteisingai atliktą vertimą, reikalavimais.

Vertėjos rekvizitai (vardas, pavardė, parašas)