STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

KAUNO TECHNOLOGIJOS UNIVERSITETO
STUDIJŲ PROGRAMOS *Medžiagos ir nanotechnologijos*
(valstybinis kodas – 612J50002)
VERTINIMO IŠVADOS

EVALUATION REPORT
OF *Materials and Nanotechnologies* (*state code -612J50002*)
STUDY PROGRAMME
at KAUNAS UNIVERSITY OF TECHNOLOGY

Experts' team:

1. **Prof. dr. Laurens Katgerman (team leader)** *academic,*
2. **Prof. dr. Janis Spigulis,** *academic,*
3. **Prof. dr. Andres Öpik,** *academic,*
4. **Dr. Denis Guilhot,** *academic,*
5. **Dr. Sergejus Orlovas,** *representative of social partners'*
6. **Ms Milena Medineckienė,** *students' representative.*

Evaluation coordinator –

Ms Rasa Paurytė

Išvados parengtos anglų kalba
Report language – English

Vilnius
2016

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	***Medžiagos ir nanotechnologijos***
Valstybinis kodas	612J50002
Studijų sritis	Technologijos mokslai
Studijų kryptis	Medžiagų technologijos
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Pirma
Studijų forma (trukmė metais)	Nuolatinės (4); ištęstinės (6)
Studijų programos apimtis kreditais	240
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Medžiagų technologijų bakalauras
Studijų programos įregistravimo data	**2006-12-29**

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	***Materials and Nanotechnologies***
State code	612J50002
Study area	Technological Sciences
Study field	Materials Technologies
Type of the study programme	University Studies
Study cycle	First
Study mode (length in years)	Full-time (3); part-time (6)
Volume of the study programme in credits	240
Degree and (or) professional qualifications awarded	Bachelor of Materials Technology
Date of registration of the study programme	29-12-2006

CONTENTS

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.	Amended table of academic staff
2.	Changes made after the preparation of self-assessment report
3.	Lecturers' mobility for academic work during evaluated period

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

On February 16, 1922, the Government of Lithuania passed a resolution on establishing a university, the first independent higher education institution in Lithuania. Kaunas University was

reorganized into Kaunas Polytechnic Institute (KPI) and Kaunas Medical Institute in 1950. In October 31, 1990 KPI changed its name to Kaunas University of Technology (hereinafter – University, KTU), regained its university status, and embarked on the road of studies and science reforms. Today KTU is ranked among the 800 best universities in the world (QS World University Rankings) and is the second best university in Lithuania (according to the ranking list of *Veidas* magazine and the new magazine *Reitingai*).

Major decisions on the reorganization of faculties and institutes were made in 2013. Since 1 January 2014 the University has 9 faculties, 9 research institutes, 20 administration and support units, Student Council, Business Council, Academic Ethics Committee etc. The number of faculty departments was decreased by half. On November 8th, 2013 the Council of Kaunas University of Technology approved a new structure of faculties (Order No. V7-T-17). Every faculty has its own laboratory centres, where department owned laboratories have been concentrated in. Studies and Business Centre – Valley SANTAKA was founded by initiative of KTU in 2008. The purpose of the Integrated Science, Studies and Business Centre (Valley) project is to create an integrated science, studies and business centre – Valley SANTAKA for public and private research, knowledge-intensive business setting and to provide value-added, knowledge-intensive services. According to the University's strategy 2012–2020, KTU has a vision – to become a leading European university developing and transferring knowledge and technologies. Today the University has 10 856 students: 7875 undergraduates, 2617 graduates, and 332 post-graduates (as of 01/10/2014). KTU delivers first, second and third cycle studies in the areas of technology, natural, social sciences, humanities, and art. The University has 751 foreign students.

The Faculty of Mathematic and Natural sciences (hereinafter MGMF) was established in 1993 as Faculty of Fundamental Sciences. After reorganization of KTU (2014), the faculty was renamed to Faculty of Mathematics and Natural Sciences. Physics department staff consists of: 7 professors, 14 associate professors, 7 lectors, 1 researcher, 3 supporting staff persons, and 5 PhD students.

The Materials and nanotechnologies (MN) programme of the first cycle (612J50002) was created by the order No. 0-65 of the Senate of KTU of 24 October 2001 and was reregistered in the Register of study and education programs in 2006-12-29 (Decree of Minister of Education and Science No. ISAK-2491). The analysed programme Materials and Nanotechnologies is lectured at KTU already for 13 years (started in 2002). This programme is in the study area of technological sciences, the first cycle studies program. The external evaluation of the MN programme was carried out by the experts from the Centre for Quality Assessment of Higher

Education. The MN programme was accredited in 17-08-2009 till 17-08-2015 according to the order of the Minister of Education and Science No.1-73 17-08-2009.

1.4. The Review Team

The review team was completed according *Description of experts' recruitment*, approved by order No. 1-01-151 of Acting Director of the Centre for Quality Assessment in Higher Education. The Review Visit to HEI was conducted by the team on *25/05/2016.*

1. **Prof. dr. Laurens Katgerman (team leader)** *Delft University of Technology, Professor Emeritus, The Netherlands.*
2. **Prof. dr. Janis Spigulis,** *University of Latvia, Professor of Physics Department, Head of Biophotonics Laboratory at Institute of Atomic Physics and Spectroscopy, Latvia.*
3. **Prof. dr. Andres Öpik,** *Tallinn University of Technology, Vice Dean of the Faculty of Chemical and Materials Technology, professor of physical chemistry, Estonia.*
4. **Dr. Denis Guilhot,** *The Institute of Photonic Sciences, Knowledge and Technology Transfer Programme Manager, Spain.*
5. **Dr. Sergejus Orlovas,** *Centre for Physical Sciences and Technology, Principal Research Fellow, Lithuania.*
6. **Dr. Milena Medineckienė,** *doctoral student of KTH Royal Institute of Technology (Lietuva, Švedija).*

II. PROGRAMME ANALYSIS

2.1. Programme aims and learning outcomes

The programme aims are listed in SER (on page 11): material technology bachelors should combine fundamental and practical engineering knowledge and be able to select, develop, deploy and use materials for various engineering applications. Bachelors are supposed to optimally choose materials and technologies for solving various engineering or technological challenges. At the end of the studies, they should have obtained practical and professional skills and abilities in development of modern technologies, as well as in processing and evaluation of scientific data. The objective of MN bachelor programme is formulated in terms of bachelor's degree requirements set in Dublin descriptors and is compliant with standards, see Table 2,2 in SER.

The objectives of learning outcomes were formulated based on the following documents of the Bologna Process: Dublin descriptors (2004), European higher education structures and activities (TUNING) project materials (2000-2004), A Framework for Qualifications of the European Higher Education Area (2005), the European qualification Framework for lifelong

learning - EOF for LLL (2008) and The common regulations of study at technological (engineering) sciences (approved by the study Minister of education and science on 29 April 2005, Order No. ISAK-734). Expected learning outcomes are presented in Table 2.3 SER.

Study programme content, objectives and expected learning outcomes are publicly accessible on the University's webpage (http://ktu.edu/). Faculty of Mathematics and Natural Sciences provides also additional information about the programme: booklets, promotional calendars, on the webpage www.fmf.lt, it has its own page in social network (*Facebook*).

The programme objectives and learning outcomes mostly address market needs and are based on the experience of foreign countries. Both objectives and learning outcomes satisfy both regulations of technological (engineers) study field and academic and professional qualification requirements for qualification of prepared specialists. However, the analysis in the SER is based on outdated 6 years old foreign demand and labour market estimates. In a rapidly changing world of technologies and material engineering, public needs and needs of the labour market should be updated on a regular basis.

Unfortunately, only 2 from 18 alumni did attend the meeting with the expert team. Thus, a meeting with social partners and programme management was the only additional source of information, which has revealed worrisome discrepancies between programme aims, learning outcomes and factual situation in the labour market. However, during the visit the team of experts has observed some positive factual changes and improvements in terms of addressing the needs of the labour market.

The analysis of the labour market should be improved on the basis of feedback provided by social partners, stakeholders, and alumni. Similar weaknesses were also mentioned in SER on p. 14, see Section 2.1.3.

The objective of bachelor study programme is formulated in terms of bachelor's degree requirements set in Dublin descriptors. The programme aims and learning outcomes are largely consistent with the type and the level of qualification offered by the programme.

However, some study objects descriptions are not up to date, thus, level of studies and qualification might be degraded over the years. The field of nanotechnologies is rapidly expanding and the programme management should ensure high level of studies by a proper choice of study objects.

The study programme is called Materials and Nanotechnologies and leads to a degree of Bachelor of Material Technology. The aims and learning outcomes are mostly consistent with the type and level of studies, as well as the course programme and content. However, its scientific branch – nanotechnologies – requires a rather high technological content, which is

slightly underrepresented in the aims and learning outcomes. Therefore the content, learning outcomes and qualifications at the present time do not fully cover the name of the programme and its innovative aspect is underrepresented.

The programme provides two minors specialisations – either in Biomaterials or in Functional Materials. Whereas the Functional Materials does fit nicely with the name of the programme, the minor specialisation in Biomaterials is underrepresented in the name of the programme. Possibly, a change in the specialisation name to "Biomaterials and nanotechnologies" could resolve this issue.

A better compatibility could be achieved through regular updates to both contents and aims of the programme, with either more specific nanotechnologies study objects or subtopics, that could make the programme more appropriate to its name.

2.2. Curriculum design

The undergraduate study programme Materials and Nanotechnologies is a 4 years programme and represents 240 ECTS. The general university courses consist of 15 ECTS credits (see Table 2.4 SER) and subjects of the study field take up to 165 ECTS credits. The remaining part of ECTS are assigned by the university to the student's elective subjects. Among them subjects of the major study field and specialization courses (30 ECTS), electives of Major Study Field or Minor Study Field (60 ECTS), and the final practice (15 ECTS credits). In overall, the legislative requirements (see, Table 2.5, SER) are met.

Distribution of study programs and individual workload is approximately 41% to 59%, which is near to the ratio observed at most European universities (50-50%). Thus, the curriculum design meets all legal requirements.

An overview of the general structure of the programme is presented in SER, see Table 2.4. The study field courses are evenly distributed with an average of 4 study field courses by semester, with exception of the 5^{th}, where only two study field courses are present in the programme. This is compensated by an increased number of electives and specialisation courses. The academic load of every semester is 30 ECTS, which is in an acceptable range.

Themes of study modules range from fundamentals and basics of science to more specific knowledge regarding technological and physical sciences and are evenly distributed along the programme. They allow for progressive learning and are complementary to allow the development of professional skills and competences for a technology bachelor.

In general, the themes of the courses are not repetitive with an exception of "Physics I" (which contains Maxwell Equations and Waves), "Physics 2" (which contains Geometrical Optics, Laser Physics and Wave Optics). Topics from those two modules are repeated in the

study module „Optics“, see Annex with study programme modules. In overall, the structure of the curriculum is good, however, programme management should revaluate contents to avoid repetition of topics and themes.

The name of the programme is “Materials and nanotechnologies”, and it provides two specialisations – either in Biomaterials or in Functional Materials. Contents of subjects and modules are in very broad range of topics and the programme seems to be very versatile and flexible. Each minor specializations is well represented and content of study modules belonging to specialization subjects is consistent with the type and level of studies. General modules mainly cover material sciences, with nanotechnologies being slightly underrepresented in the general courses and in the minor specialization of Biomaterials. Nevertheless, all formal requirements are met and the content of the courses is largely consistent with the type and level of the studies.

However, the programme belongs to the technological field and some additional attention should be paid to practice, semester and final projects. Industrial and technological partners should be involved into management of practice and study projects.

The main technical learning outcomes are oriented towards material sciences and nanotechnologies and the programme belongs to the technological field descriptor. In general, subjects/modules are appropriate for the achievement of the intended learning outcomes. It is worth mentioning, that contents of study modules “Nanostructures and Nanomaterials” and “Functional Materials and Nanotechnologies” are crucial at achieving learning outcomes C1 and C2, which are related to “mastering nanotechnological engineering and equipment”. Programme management could consider a possibility to enhance those two study modules and to organise a crucial link to both industrial and technological social partners and enable students to successfully achieve learning outcomes C1 and C2.

The scope of the programme is sufficient to ensure learning outcomes. Considering the innovative and scientific aspect of the programme, and, as identified during the visit of the review team, the scope of the programme could benefit from stronger ties with social partners at research institutions and industry: more attention should be put to performing practice and to obtaining practical skills, it would be beneficial to both students and employers. The emphasis should remain not only on applied subjects related solely to materials but rather on fundamental and innovative aspects of material science. Diversity and flexibility is what both students and social partners mostly appreciate about this programme.

The content of the programme largely reflects the latest achievements in science and technology. According to the self-evaluation report, programme modules and the programme are certified internally at least once every three years. During the visit, programme management ensured the expert team that they encourage improvements each semester. Teachers update the

programme yearly, through the introduction of new seminar subjects and new topics into the programme modules. However, an analysis of study module programmes (SMP), which were provided in Annex 1 (Descriptions of study subjects), has revealed a worrisome number of typos, non-existent literature, outdated text books and scarce number of most recent English literature in the field of nanotechnologies. For example, in the case of SMP "Nanostructures and Nanomaterials", no additional literature is given at all and the main textbook is in Lithuanian (J. Vilys, S. Tamulevičius, V. Grigaliūnas, Š. Meškinis, A. Guobienė. Surface engineering and nanotechnology (*in Lithuanian*). Textbook. Kaunas: Vitae Litera, 2007. 225 pages). Same applies to SMP "Phenomena of Modern Optics and Nanophotonics" and "Functional Materials and Nanotechnologies", which are the sole courses reflecting the nanotechnology part of the study programme's name.

The subjects of the Bachelor's final thesis largely reflect the latest achievements in science and technology, however the content can be further improved given the strong ties with newly established "SANTAKA" science valley.

2.3. Teaching staff

The staff delivering lectures for bachelor students (37 persons) is qualified enough: 10 professors, 25 associate professors, and 2 PhD's. The scientific experience of the professors and associate professors delivering lectures at MN bachelor studies programme exceeds formal legal requirements (7 years). The legal requirement to have not less than 50% of the study subjects given by scientists is satisfied. Speaking about minor specialisation, about 80 % of study modules in Biomaterials specialization and 72 % in Function materials specialization are given by the professors and associated professors. Thus, all legal requirements are met.

Academic qualification of the teaching staff is adequate. From the List of Teachers (Annex 3.2.), the expert team can conclude that the majority of the teaching staff has a PhD degree in the fields related to their study modules. Scientific qualifications of the teaching staff responsible for general courses are mostly adequate to ensure the largest part of programme's learning outcomes.

However, some concerns can be raised on the scientific qualification of the teaching staff, responsible for study modules dealing with modern nanotechnologies. Persons responsible for study modules "Physical Fundamentals of Micro- and Nanotechnology", "Functional Materials and Nanotechnologies", "Nanostructures and Nanomaterials" could have better scientific metrics: total impact factor, h-index etc. Though academic qualifications meet formal requirements, both the programme and students would greatly benefit from improvement of

scientific qualifications of the teaching staff responsible for the SMP's related to the hottest scientific and technological topics.

The current ratio of approximately 1,56 students for 1 lecturer (depending on the year of the study program) is less than the acceptable norm. According to the SER, full professors, associate professors and lecturers of Physics Department supervise one or two final degree projects. Teaching staff performs on average from 48 to 160 contact hours, On average professors account for 23,35% of teaching hours, associate professors for 52,3% of contact hours and teachers with lower qualification account for the remaining part. On yearly average, the number and the availability of the teaching staff seems to be adequate to ensure the learning outcomes. From the average perspective all amounts seem to be quite reasonable.

However, some concerns can be raised after looking at individual workloads. One of the professors has a humongous amount of 386 teaching contact hours. Some professors have up to 2 or 3 SMPs during the Semester, among them one professor who bears responsibility for administrative tasks. Working conditions for the teaching staff could be greatly improved by introduction of assistants and doctoral students into the list of teachers.

The change of the programme lecturers is controlled by the Department of Physics and the teaching staff of eight SMP's were replaced by new members of staff. The age is the main reason for the lecturers change. The retired teachers are substituted by qualified lecturers who have been prepared in advance to take their subjects. According to Table 2,9 in SER, the structure of the academic staff by age groups is adequate to ensure provision of the programme.

Mobility aspects of the professional development are on a relatively good level. According to the SER, lecturers have a possibility to go for teaching or training at foreign higher education institutions using the Lifelong Learning programme (an ERASMUS subprogram). For example, the faculty had 7 bilateral agreements for the students and lecturers exchange in 2007-2008, 8 agreements in 2008-2009, 9 agreements in 2009-2010, 11 agreements in 2010-2011, 17 agreements in 2011-2012, 18 agreements in 2012-2013, 21 agreements in 2013-2014, and 24 agreements in 2014-2015. A detailed list of lectures delivered or internships at foreign universities attended is given in the Table 2.6, see SER.

It seems, that the main mobility aims were scientific and teaching visits, professional and scientific qualification improvements. The Faculty encourages the mobility of the teachers, therefore the HEI creates professional conditions necessary for their career.

Lecturers, researchers, administrative and other staff must improve their qualification at least once in five years. Nevertheless, during the visit, the question was raised on the possibility for sabbatical leaves. Programme management should encourage university administration to create all necessary conditions on national level.

The teaching staff is largely involved in research. It is understandable that only part of the teaching staff shows reasonable scientific activity, since their main responsibility are general university study objects. The programme under considerations is a bachelor study programme, therefore only teaching staff responsible for specialisation courses should be involved in research activities directly related to the study programme.

From the list of projects in which teaching staff was involved during the timeframe 2005-2015, one can conclude that the most active period was 2012-2015. Unfortunately, starting from 2016, only a few research projects are ongoing. The total impact factor and the H-indices of the teaching staff responsible for nanotechnology objects do not reflect proper scientific activity and quality of publishing, which should be expected from scientists working in the field on nanotechnologies. It is, in general, less than 10 (with one exception).

Though on one hand these metrics are satisfactory, given the presence of high level scientific cluster SANTAKA in the same area, expert team expects to see improvements in the scientific metrics of the teaching staff responsible for SMP dealing with scientific hot topics. We recommend to the university management to support scientific activities and organise collaborations with entities residing in the SANTAKA cluster. The potential for such collaborations is high, especially due to the cooperation with the research institutions National Open Access Centre for Future Energy Technologies and Science and technology park of Institute of Physics.

2.4. Facilities and learning resources

According to the Self Evaluation report, classroom occupancy norms for the programme under consideration is approved by the Rules of Pedagogical Work Accounting[1]: for lectures, rooms have places for 100 students; for practical lessons, for 25 students; and for laboratory works, laboratories have up to 12 places. During the visit, the expert team has concluded that the number of laboratories is sufficient and classrooms are in compliance with hygiene and work safety norms. Some classrooms are located in adjacent buildings, the distance between them never exceeds 300 m. Most of the classrooms seem to have been renewed during the last years and the faculty provides them with both cable and wireless access to the internet. Some classrooms are equipped with smart computerised whiteboards, thus, premises for studies are adequate both in size and quality.

Two computer classrooms are available for students and computers were renewed during the last 3-4 years. SER states that the computer classroom No. 506 was renovated in 2014, it has 25 work places. The second computer classroom SC103F has 17 work places, and computers are

[1] Pedagogical work accounting regulations. Confirmed by the Rector's Order No. A-377 of July 17, 2014.

up to modern standards. An additional access to computer classrooms shared by the university is also available. During the visit, the team of experts was made familiar with computer software available to the students. An impressive number of legal software was installed in computers and was made available to the students either via VPN connection or via Virtual Desktops in the computer cloud. An unlimited number of licenses is available for professional computer programmes like SAS, APL2, MathCad, MatLab. The software is constantly updated and students have free access to cloud based MS Office 365 program package. According to the data provided by SER, about 30 000 EUR were spent for purchase of software licenses. An efficient Moodle environment is made available to the students.

From the large number of laboratories shown to experts, 18 laboratories are specific to the programme: laboratory of detectors of radiation (4 work places); laboratory of thin films physics and technology (4 work places); two laboratories for optical measurements (11 work places) ; laboratory of vacuum technology (4 work places); laboratory of physical technologies (14 work places); X-ray laboratory (1 work place), laboratory of solid state and optical systems (16 work places), laboratory of electrodynamics and non-destructive testing methods (18 work places); laboratory of physical modelling (2 work places); laboratory of physical processes simulation (4 work places); laboratory of radiometry (14 work places); laboratory of dosimetry (12 work places); laboratory of radio spectrometry (2 work places). 5 laboratories for were recently renewed and a ~0.4 million EUR investment into research equipment was recently made. Thus, the teaching and learning equipment is more than adequate both in size and quality.

Mandatory practice (module T000B100 "Practice of Materials Science") at the 8th semester is accredited by 15 ECTS credits. During the practice module, students are either directed to a company or to the partner institutes. Some students perform practice at the department. The programme management has two long-term arrangements with research institutions – Lithuanian Energy Institute and Institute for Materials Science. Among new partners offering places for professional practice are both research institutions (for example, Center for physical science and technology) and companies (UAB Elintos matavimo sistemos, UAB Fudo, UAB Rubedo sistemos, UAB Sportralė, UAB SK Impex Service Center, UAB Brolis Semiconductors etc). Though students and social partners were asking for more collaboration in arrangement of practice places and hours, all formal requirements are met. The HEI provides an adequate arrangements for students' practice, however, it might be useful to introduce a possibility for individual practice during early semesters.

An initial analysis of SMP's provided in the Annex has revealed worrisome numbers of printed books unavailable for students. Part of the books was either unavailable at the university bookstore or the amount of books was too low. Nevertheless, during the visit, it was clarified

both by the programme management team and by the teaching staff that the university is rapidly replacing printed textbooks with electronic books freely available for students either via e-library, or via an efficient Moodle system. All textbooks crucial to the programme, together with those publications important for the study programme, are available for the students at https://www.ebooks.ktu.lt/main.php.

On one hand, it is worth congratulating teachers on the large number of textbooks written by the staff, on the other hand, students would greatly benefit from original worldwide acknowledged courses in English. This would give a good opportunity for the students to increase their English skills and to better prepare themselves for European labour market. Unfortunately, though the number of books in English is adequate, the choice is not diverse and they are not the best in the field.

Electronic databases are available either from computer classes or from the home computer via VPN. An adequate number of subscribed databases is available to the students through the Intranet. Electronic handouts of the lecture slides are also accessible. Thus, overall, the accessibility and adequacy of teaching material is good.

2.5. Study process and students' performance assessment

The admission is carried out according to the "Students' admission rules to KTU 2015"[2] that are approved every year by the University Senate up to the date appointed by Ministry of Education and Science. Admission rules provide necessary minimal educational requirements for admission information, competitive queuing principles and criteria. All the information about admission and about the programme are available via a variety of internet (http://ktu.edu/lt/stojantiesiems, http://mgmf.ktu.edu) and printed sources (informational issue „Bakalauro Studijų programos KTU").

The Table 2.11 from the SER provides at first glance a worrying insight on the results of admission to the study programme. Average and lowest admittance marks are not on par with the quality and the level of the studies. However, on-site updates, which experts have received during the visit, prove that the situation is improving. Students with better marks are attracted and the programme management should keep on working towards programme's visibility. In overall, the admission requirements seem to be well-founded.

Full-time form studies are organized at the end of the 16 weeks duration studies. The schedule of the studies is made by the dean's office and is announced in the academic

[2] Rules for students' admission to Kaunas University of Technology in 2015, approved by the Kaunas University of Technology Senate Resolution No. V3-S -2, January 28, 2015.

information system and public information places at the university (DVS System, Intranet)[3]. Students can participate in the elaboration of the schedule in collaboration with the Dean's Office. According to the SER, the exam schedules are prepared collectively with lecturers and students. Exams are announced within the first month of the semester. Students register to the exam by themselves one month before the start of the session. Students perform individual studies during the spring Semester and their implementation plan is based on a legal basis to grant the appropriate degree. In the case of illness permission to perform the missed tasks are given for free. Students can ask for permission to re-take examination, if they are not satisfied with the previous evaluation grade.

Unfortunately the dropout rate during 2008-2012 years was alarmingly high, see Table 2.12 SER, on average half of the students dropped out with only one-third left in the years 2006-2010. No data is available for the years 2013 and 2014, due to the fact the programme was closed for reorganisation. On the bright side, the data available for the last years demonstrates acceptable drop-out rates. Overall, the organisation and the study process ensure adequate provision of the programme. However, the rate at which students achieve the learning outcomes should be further improved. In the light of alarmingly high rates of students who did not achieve the grade, the programme management should better motivate students to keep on studying.

Mentorship programs (Peer mentor, academic advisor, career mentor, research mentor) at the university (http://ktu.edu/en/students) are available for students. They provide an efficient way for the students to get involved in the research activities and to increase their academic performance. Students can be involved in the scientific work already during the first, the second and the third year courses, and research mentors can be assigned. They might also successfully continue their studies in further Master and doctoral programs.

During the practical seminars, students are introduced to scientific research and made familiar with the latest scientific and applied research activities at the institution and in the world. Partner institutions (LEI and IAS) also provide students with possibilities to both familiarize themselves with, and get involved in research activities.

Students have possibilities and are encouraged to go abroad for one semester and to study in the higher education institutions. These possibilities are provided by student's mobility programs and 24 bilateral agreements for students' and lecturers' exchange in 2014-2015. Among partner institutions are such well-established academic and research centres like Karlsruher Institut fur Technologie (Germany), Martin Luther Universitat Halle Wittenberg (Germany), Université de Poitiers (France), Universita di Trieste (Italy), Warsaw University of

[3] Rector's Order No. A-279 of June 30, 2003 for student registration to studies. Kaunas University of Technology Rector's order No. a-279 of June 30, 2003. "on the registration of students for studies" having lost power No. A-613 of December 10, 2014.

Technology (Poland), Ankara University (Turkey), Université de Strasbourg (France), University of Helsinki (Finland), Lund University (Sweden), etc. The number of students leaving for part time studies abroad is given in Table 2.13 SER.

Students are academically supported either by individual mentorship or by consultations with the teachers, administration of the faculty, and the tutors and mentors[4] on issues they encounter during their academic studies. Individual consultations with the teaching staff can be arranged. Electronic remote consultations by e-mail on the virtual learning environment Moodle are also available. As stated in SER, "according to student opinion survey results, 74.5 % of students think that such academic support is necessary for the majority of students; about 30 % of first year and second year students use the services of this 'room'; 85 % of these students stated that consulting room services were very helpful". Thus, the HEI ensures an adequate level of academic support.

Social financial support provided via scholarships is irreclaimable: One-time social scholarships can be awarded to full-time and part-time students of the first and the second study cycles. Unfortunately, those students are requested to have no academic debts and have to be financed by the State. Motivational scholarships are granted to the students who achieve excellent academic results and are proactive. Given the high students' dropout rate in the past, a more flexible social support system should be introduced, which could motivate even academically underachieving students to keep on study and to perform better.

Academic dishonesty and plagiarism are controlled using modern computer systems and all required preventative measures are used during examination and assessment: a personal identification card (or similar id) is required, the majority of exams are in written form, teaching staff is present during assessment. The examination tasks are updated on regular basis, computerized tests are widely used. Students defend their individual, laboratory or semester works. Zero tolerance of academic dishonesty is identified during students' surveys.

The assessment system is determined by the Rules of Study Module Results Evaluation approved by the University rector[5]. The evaluation system and criteria are also introduced during the first lecture at the beginning of the semester. Overall, the assessment system is clear.

The requirements for assessment of the study module are publicly available at academic database and they can also be accessed individually at https://uais.cr.ktu.lt/ktuis/stp_prisijungimas/. Students can access this database using their unique login names and passwords. After login their individual results are accessible. Privacy and data

[4] The mentoring programme organization Procedure description (approved by the rector's Order No. A-501, October 21, 2013).
[5] Account for study module regulations (approved by Rector's Order No. A-253, May 12, 2014, replaced by the Rector's Order No. A-582, December 3, 2014).

protection are guaranteed by encryption protocols. Thus, the system is accessible in an adequate manner.

The defence of the final degree project is public and student answers questions of the reviewer, defence committee and audience.

Statistics provided by the self-evaluation team give some insights on whether current professional activities of graduates meet expectations. From fifty graduates who graduated during the last five years, 24% went for further studies as masters in the same field. About one fifth of them (18 %) started studies in other Master programs (Medical Physics, Applied Physics) at the same faculty. Statistics on the remaining graduates are rather scarce. Surely they are not unemployed, however it is unclear whether they work in a related field. Claim is made in SER that "two-thirds of graduates work in the field … (and) are closely related to MN bachelor's study program".

During the visit, the team of experts was given a rather large list of alumni, who was invited to come and express their opinion on their current professional activities. Unfortunately, only two BA studies alumni did show up. However, from the information provided by the programme management, experts could conclude that their professional activity is not related to their field of study.

Overall, the expert team can conclude that the introduction of a larger number of social partners in the programme management might increase the professional outcome opportunities for the students of the study programme.

2.6. Programme management

Programme administration is carried out in accordance with the Statute of KTU (approved by decision of Seimas of Republic of Lithuania No. XI-2149 of 28 June, 2012), Temporal Academic Regulations of Kaunas University of Technology (approved by the decision of KTU Senate No. V3-S-48 of 20 June, 2012), KTU Academic Code of Ethics (approved by decision of KTU Senate No. V3-S-1 of 25 January, 2012). These documents define the management and decision-making of the structure and the responsibility of its administrators. The study programme administration and inner quality assurance is controlled and coordinated by vice-rector for studies with the help of Studies Department, Student Affairs office, Information Systems' office, Strategy Implementation and Quality Assurance office.

The Faculty Council (15 members, stake holders and 3 student representatives are also involved) reviews the study programmes and implements the decisions on the teaching staff. Study module programmes are controlled by lecturer. The dean and the heads of the departments have the right to participate in classroom sessions or nominate other lecturers to provide

suggestions about improvement of the module content and teaching. Thus, responsibilities are clearly allocated.

Quality assessment of the programme is carried out according to the KTU Guide of Quality[6] approved by the decision No. V3-S-45 of 11 June 2014 of the Senate. Activities of quality management system cover management of studies, monitoring of research and educational activities. In accordance with the Law of Science and Education, attestation (once in five year cadence) of teaching staff determines whether lecturers match the qualification requirements. Additionally, teaching staff from internal and external entities are attracted with the help of organized enrolments to take a position.

There is a feedback system at KTU, based on periodical surveys. Students, graduates, teachers and employers are periodically (in the middle of semester, at the end of semester, after graduation, etc.) asked to evaluate study subjects, study programmes and other aspects of academic life. Newly introduced midterm surveys allow lecturers (and administration) to react to remarks of students during the current semester and introduce some changes into studies methods, forms of knowledge transfer, etc.

"Round table" meetings of students, the Faculty administration and managers of study programmes are organised periodically and issues related to studies quality are discussed there. Therefore, all information and data are regularly collected and analysed.

Both lecturers and faculty administration can access evaluation results of all relevant study programme modules and base improvements on the outcomes of internal evaluations. A delegate Manager of the FSPC (lect. K. Bočkutė) together with FSPC carries responsibility for the content and quality of the study programme. She prepares the descriptions of the programme, among her responsibilities are programme aim and learning outcomes. She prepares proposals for changes of the programme or subjects content, she is involved in analysis of the feedback forms, after students and teachers answer questionnaires. Her responsibility is the preparation of plans for further improvements. Thus, internal evaluations are used for the improvement of the programme.

External evaluation is also performed. The questionnaire is distributed to the graduates. It recently demonstrated that students would like to see a tighter connection with practical application of the subject. However, those external evaluations could be largely improved: for example, direct involvement of the social and industrial partners, and motivated alumni (who is professionally active in the same area) in the evaluation process could greatly enhance the overall outcome of external evaluation and address problems in a timely manner.

[6] Guide of quality of KTU. Approved by KTU Senate in 11 June, 2014. Resolution No. V3-S-45.

Representatives of employers – members of Study Programme Committee, Faculty Council, and Qualification committees are involved both in evaluation and improvement processes. However, not all stakeholders are involved in Committees or Council so they are underrepresented and participate in a formal way, though they could be involved more through participation in various meetings. More personal contacts of stakeholders with lecturers and stronger informal involvement in the evaluation and processes related to the improvement of the programme would be of great importance.

Comparison of strengths and weaknesses revealed by the internal self-evaluation team and found by the review team demonstrates that the internal quality assurance measures are on large scale efficient and effective, though discrepancies in the views of SER team and experts prove that there are still some inefficiencies, which should be eliminated.

During the visit, the review team concluded that the main reason for the existence of those inefficiencies and differences in the views is lack of communication or ineffective communication between programme management, teaching staff, students, social partners and alumni. For example, students wish to receive more practice, social partners would like to see more students performing practice. Teaching staff would like to have more tight links with diverse industrial partners, and industrial partners would like to be more involved into the teaching process. Experts did found many occurrences, where both sides are willing to cooperate but are not cooperating due to the lack of communication. Programme management should make its best to organise those missing or inefficient links between all involved sides.

2.7. Examples of excellence *

KTU possesses an exceptionally well organised virtual teaching environment: students can access programmes and data stored in the cloud, virtual classrooms and chatrooms with teaching staff. Large scale investments into computer and software infrastructure largely contribute to unprecedentedly well (for Lithuania) organised teaching process.

Access to the high technological research equipment of KTU Materials Science Institute (SANTAKA valley) and Laboratory of Hydrogen Energy of Lithuanian Energy Institute.

III. RECOMMENDATIONS

1. The programme management should improve their analysis of the labour market on the basis of feedback, provided by social partners, stakeholders, and alumni.
2. Programme management should ensure high level of studies by a proper choice of study objects. Study object descriptions should be up to date.
3. The programme management should more actively search for new social partners with industrial profile (possibly outside Kaunas region) and organise possibilities for students' practice.
4. The minor specialisation in Biomaterials is underrepresented in the name of the programme. Programme management should discuss a possible change in the specialisation name (perhaps "Biomaterials and nanotechnologies" could resolve this issue).
5. Better compatibility could be achieved by regular updates with either more nanotechnologies specific study objects or subtopics. This could make the programme more appropriate to its name.
6. Industrial and technological partners should be involved into management of practice and study projects. Programme management should organise a crucial link to both industrial and technological social partners and enable students to successfully achieve those learning outcomes. The content can be further improved given the strong ties with newly established "SANTAKA" science valley.
7. To improve the international mobility, the condition to be proficient in English (writing and speaking) is paramount. This applies to lecturers as well as students. Faculty management should give many opportunities to improve language skills..
8. Try to involve more foreign students and/or students outside of Kaunas region in the programme and implement a constant action programme in order to attract students to select this programme.
9. Introduce a system for sabbatical leaves of lecturers, which gives possibilities for longer visits. Ensure that teachers directly involved into teaching nanotechnologies and biomaterials more actively improve their scientific qualifications.

IV. SUMMARY

Strengths

The content of the programme reflects in general the latest achievements in materials science. This will be provided by the cooperation between the programme and research institutions as National Open Access Centre for Future Energy Technologies and Science and technology park of Institute of Physics (Santaka).

Research facilities and research equipment of KTU Materials Science Institute and Laboratory of Hydrogen Energy of Lithuanian Energy Institute support the programme "Materials and Nanotechnologies". The conditions for students' participation in research are very good because of the partner institutions.

Academic and other types of support for the students are regular. Students with weaker performance are supported by constant assistance during individual guidance by teaching staff. Mentorship programmes for underperforming or weak on enrolment students are available. New guidelines regarding one month away are introduced, thus, enabling students to flexibly adjust studies with other life activities.

Information about study program, scholarships, study goals and learning outcomes are regularly updated and are actual. University webpage provides regular updates on evaluation of achievements, elective subjects, schedules, and mobility possibilities. This information is also available on the web page of the Faculty, KTU Students information centre. Additionally students are informed by e-mail, they can follow up information on Facebook and other media. "KTU Career days" were organized systematically by the university and social partners.

KTU possesses an exceptionally well organised virtual teaching environment: students can access programmes and data stored in the cloud, virtual classrooms and chatrooms with teaching staff. Large scale investments into computer and software infrastructure largely contribute to unprecedentedly well (for Lithuania) organised teaching process.

The electronic library provides access to the electronic journals and databases, which are available as well for students and researchers from the library, laboratories or homes.

Unique content of the programme with two minor specialisations either in nanotechnologies or biomaterials.

The number of social partners has increased by a third and, more importantly, new partners with strong industrial link and world-wide known names (like Hitachi, ThermoFisher etc) are joining.

Areas for improvement

It deserves to be noted that the number of enrolments and the number of graduates though improving are still disappointingly low. Experts assume that the improvement of the analysis of the labour market can help to overcome those hurdles. The programme management should more actively search for new social partners with industrial profile (possibly outside Kaunas region) and organise possibilities for students' practice.

It seems, that the feedback provided to the programme management by social partners, stakeholders, and alumni can be further improved. Indeed, the feedback received from the stakeholders and alumni during the site visit confirms that.

The participation of the business and industrial representatives and as well the research staff of the department in the program activities (especially in Research Projects) could be increased. It seems, that bachelor students are interested in a tighter links with researchers of the department and with industrial partners. The programme management should consider increasing the number of projects initiated by the research institutions and industrial partners.

Investigation of study modules has revealed some incompatibilities in the name of the programme and its contents. Nanotechnologies specific study objects or subtopics should be updated on a more regular basis. The minor specialisation in Biomaterials is underrepresented in the name of the programme. In order to make the programme more appropriate to its name the programme management should discuss a possible change in the specialisation name (perhaps "Biomaterials and nanotechnologies" could resolve this issue).

Study object descriptions should be up to date. They contain now a worrisome number of small typos, misspelled words and factual errors. The contents of specific study objects can be further improved given the strong ties with newly established "SANTAKA" science valley.

The number of the books in the library and in the bookstore is low. Though the excellent electronic teaching system (like Moodle) might compensate for that, the students should be given a choice, either to use a library book, or to read electronically. Book reading also has some health benefits in comparison to electronic books.

Teachers should be encouraged to improve their professional and scientific qualification more actively. The university management should more actively support staff's teaching and research activities. Introduction in the faculty of the system of sabbatical leave for the teachers would be beneficial and give them possibilities for longer or short periodical visits to foreign or another Lithuanian institutions. Perhaps, the mobility of teachers could be supported by the university financially.

V. GENERAL ASSESSMENT

The study programme Materials and Nanotechnology (state code – 612J50002) at Kaunas University of Technology 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	3
4.	Facilities and learning resources	4
5.	Study process and students' performance assessment	3
6.	Programme management	3
	Total:	**19**

*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. Laurens Katgerman
Grupės nariai: Team members:	Prof. dr. Andres Öpik
	Prof. Dr. Janis Spigulis
	Dr. Denis Guilhot
	Dr. Sergejus Orlovas
	Dr. Milena Medineckienė

KAUNO TECHNOLOGIJOS UNIVERSITETO PIRMOSIOS PAKOPOS STUDIJŲ PROGRAMOS *MEDŽIAGOS IR NANOTECHNOLOGIJOS* (VALSTYBINIS KODAS – 612J50002) 2016-09-26 EKSPERTINIO VERTINIMO IŠVADŲ NR. SV4-212 IŠRAŠAS

<...>

V. APIBENDRINAMASIS ĮVERTINIMAS

Kauno technologijos universiteto studijų programa *Medžiagos ir nanotechnologijos* (valstybinis kodas – 612J50002) 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	4
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	3
	Iš viso:	**19**

* 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)

<...>

2.7. Išskirtinės kokybės pavyzdžiai

KTU virtualaus mokymo aplinka yra ypač gerai organizuota: studentai gali naudotis debesijoje saugomomis programomis ir duomenimis, virtualiomis klasėmis ir pokalbių svetainėmis su dėstytojais. Itin didelės investicijos į kompiuterių ir programinės įrangos infrastruktūrą sudarė sąlygas išplėtoti puikiai organizuotą mokymo procesą, kuriam Lietuvoje nėra lygių.

Suteikiama prieiga prie KTU aukštųjų technologijų mokslinės įrangos KTU Medžiagų mokslo institute („Santakos“ slėnyje) ir Lietuvos energetikos instituto Vandenilio energetikos technologijos centre.

<...>

IV. SANTRAUKA

Stiprybės

Programos turinyje bendrai atsispindi naujausi medžiagų mokslo pasiekimai. Tai užtikrinama programai bendradarbiaujant su mokslinėmis institucijomis, tokiomis, kaip Nacionalinis atviros prieigos ateities energetikos technologijų mokslo centras ir Fizikos instituto mokslo ir technologijų parkas („Santaka“).

Studijuojant programą „Medžiagos ir nanotechnologijos“ leidžiama naudotis KTU Medžiagų mokslo instituto ir Lietuvos energetikos instituto Vandenilio energetikos technologijos centro mokslinių tyrimų patalpomis ir įranga. Partnerių institucijose studentams sudaromos labai geros sąlygos dalyvauti mokslinėje veikloje.

Studentams nuolat teikiama akademinė ir kitokio pobūdžio pagalba. Studentams, kuriems sekasi silpniau, dėstantysis personalas nuolat padeda individualiai. Silpniau besimokantiems studentams siūlomos mentorių programos. Prieš mėnesį skelbiamos naujos gairės, taip sudaroma galimybė studentams lanksčiai suderinti studijas su kitais užsiėmimais.

Informacija apie studijų programą, stipendijas, studijų tikslus ir studijų rezultatus nuolat atnaujinama ir aktuali. Universiteto tinklalapyje nuolat teikiama atnaujinta informacija apie pasiekimų įvertinimą, pasirenkamuosius dalykus, tvarkaraščius ir judumo galimybes. Ši informacija taip pat teikiama ir fakulteto tinklalapyje, KTU Studentų informacijos centre. Be to, studentai informuojami elektroniniu paštu, jie gali sekti informaciją socialiniame tinkle „Facebook“ ar kitose informavimo priemonėse. Universitetas ir socialiniai partneriai sistemingai organizuoja „KTU karjeros dienas“.

KTU virtualaus mokymo aplinka yra ypač gerai organizuota: studentai gali naudotis debesijoje saugomomis programomis ir duomenimis, virtualiomis klasėmis ir pokalbių svetainėmis su dėstytojais. Itin didelės investicijos į kompiuterių ir programinės įrangos infrastruktūrą sudarė sąlygas išplėtoti puikiai organizuotą mokymo procesą, kuriam Lietuvoje nėra lygių.

Elektroninėje bibliotekoje suteikiama prieiga prie elektroninių žurnalų ir duomenų bazių, prie kurių studentai ir mokslininkai gali prisijungti iš bibliotekos, laboratorijų ar namų.

Programos turinys yra unikalus; joje išskiriamos dvi specializacijos – nanotechnologijos ir biomedžiagos.

Socialinių partnerių padaugėjo vienu trečdaliu, o svarbiausia, kad prisijungia nauji partneriai, turintys stiprius pramoninius ryšius ir pasaulyje žinomus pavadinimus (kaip „Hitachi“, „ThermoFisher“ ir kt.).

Tobulintinos sritys

Verta paminėti, kad stojančiųjų ir absolventų skaičius nors ir auga, bet, deja, vis dar yra labai mažas. Ekspertų manymu, darbo rinkos analizės tobulinimas galėtų padėti įveikti šias kliūtis. Programos vadovybė turėtų aktyviau ieškoti naujų pramoninio profilio socialinių partnerių (galbūt, ne tik Kauno regione) ir organizuoti galimybes studentams atlikti praktiką.

Programos vadovybei socialinių partnerių, socialinių dalininkų ir absolventų teikiamas grįžtamasis ryšys galėtų būti labiau tobulinimas. Iš tiesų, ekspertų apsilankymo metu iš socialinių dalininkų ir absolventų gautas grįžtamasis ryšys tai patvirtina.

Verslo bei pramonės atstovai ir katedros moksliniai darbuotojai galėtų aktyviau dalyvauti programos veikloje (ypač tiriamuosiuose projektuose). Bakalauro studentai yra suinteresuoti palaikyti artimesnius ryšius su katedros moksliniais darbuotojais ir pramonės partneriais. Programos vadovybė turėtų didinti mokslinių tyrimų institucijų ir pramonės partnerių inicijuotų projektų skaičių.

Studijų modulių analizė atskleidė, kad programos pavadinimas yra ne visai suderinamas su jos turiniu. Su nanotechnologijomis susiję studijų dalykai ar temos turėtų būti dažniau atnaujinamos. Gretutinė biomedžiagų specializacija programos pavadinime yra per mažai reprezentuojama. Programos vadovybė turėtų apsvarstyti galimybę pakeisti specializacijos pavadinimą (galbūt pavadinimas „Biomedžiagos ir nanotechnologijos“ padėtų išspręsti šią problemą).

Studijų dalykų aprašai turėtų būti atnaujinti. Dabar juose ypač daug nedidelių spausdinimo klaidų, rašybos klaidų ir klaidingų faktų. Konkrečių studijų dalykų turinys galėtų būti dar labiau tobulinamas atsižvelgiant į stiprius ryšius su naujai įsteigtu „Santakos“ mokslo slėniu.

Bibliotekoje ir knygyne yra mažai knygų. Nors puikiai veikianti elektroninė mokymo sistema (tokia, kaip „Moodle“) gali šį trūkumą kompensuoti, studentams turi būti sudaryta galimybė rinktis, ar skaityti popierinę, ar elektroninę knygą. Popierinės knygos skaitymas, palyginus su elektronine knyga, yra mažiau kenksmingas sveikatai.

Dėstytojus reikėtų skatinti aktyviau tobulinti savo profesinę ir mokslinę kvalifikaciją. Universiteto vadovybė turėtų aktyviau remti personalo dėstymo ir mokslinių tyrimų veiklą. Būtų naudinga fakultete įvesti mokslinių atostogų sistemą dėstytojams bei sudaryti jiems galimybes trumpiau ar ilgiau išvykti į užsienio ar kitas Lietuvos institucijas. Galbūt universitetas galėtų finansiškai remti dėstytojų judumą.

<…>

III. REKOMENDACIJOS

1. Programos vadovybė turėtų geriau atlikti darbo rinkos analizę, grindžiamą socialinių partnerių, socialinių dalininkų ir absolventų teikiamu grįžtamuoju ryšiu.

2. Programos vadovybė turėtų užtikrinti aukštą studijų lygį deramai parinkdami studijų dalykus. Studijų dalykų aprašai turėtų būti atnaujinti.

3. Programos vadovybė turėtų aktyviau ieškoti naujų pramoninio profilio socialinių partnerių (galbūt už Kauno regiono ribų) ir organizuoti galimybę studentų praktikai.

4. Gretutinė biomedžiagų specializacija programos pavadinime yra per mažai reprezentuojama. Programos vadovybė turėtų apsvarstyti galimybę pakeisti specializacijos pavadinimą (galbūt pavadinimas „Biomedžiagos ir nanotechnologijos“ padėtų išspręsti šią problemą).

5. Galima būtų pasiekti geresnio suderinamumo reguliariai atnaujinant labiau su nanotechnologijomis susijusius studijų dalykus, arba susijusias temas. Tokiu būdu programa labiau atitiktų pavadinimą.

6. Pramonės ir technologijų partneriai turėtų dalyvauti vadovaujant praktikos ir studijų projektams. Programos vadovybė turėtų sukurti svarbų ryšį su pramonės bei technologijų socialiniais partneriais ir padėti studentams sėkmingai pasiekti šių studijų rezultatų. Turinį galima dar labiau tobulinti atsižvelgiant į stiprius ryšius su naujai įsteigtu „Santakos“ mokslo slėniu.

7. Siekiant pagerinti tarptautinį judumą svarbu tenkinti pagrindinę sąlygą – puikiai mokėti anglų kalbą (raštu ir žodžiu). Ši sąlyga galioja dėstytojams ir studentams. Fakulteto vadovybė turėtų suteikti daug galimybių kalbos įgūdžiams tobulinti.

8. Rekomenduojama siekti į programą įtraukti daugiau užsienio studentų ir (arba) studentų ne iš Kauno regiono ir įgyvendinti nuolatinę veiksmų programą tam, kad studentai būtų saktinami pasirinkti šią studijų programą.

9. Rekomenduojama dėstytojams taikyti mokslinių atostogų sistemą, kuri sukurtų ilgesnių vizitų galimybes. Užtikrinti, kad tiesiogiai nanotechnologijų ir biomedžiagų dalykus dėstantieji dėstytojai aktyviau tobulintų savo mokslinę kvalifikaciją.

<…>

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)