



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Šiaulių universiteto
STUDIJŲ PROGRAMOS *OPTOMETRIJA*
(valstybinis kodas – 612F36001)
VERTINIMO IŠVADOS

EVALUATION REPORT
OF *OPTOMETRY* (state code – 612F36001)
STUDY PROGRAMME
at Šiauliai University

Experts' team:

1. **Dr. Terence Clifford-Amos (team leader)**, *academic*,
2. **Prof. dr. Janis Spigulis**, *academic*,
3. **Dr. Rynno Lohmus**, *academic*,
4. **Prof. dr. Artūras Jukna**, *academic*,
5. **Dr. Danas Ridikas**, *social partner*,
6. **Mr Benas Gabrielis Urbonavičius**, *student member*.

Evaluation coordinator – Mrs Eimantė Bogdan

Išvados parengtos anglų kalba
Report language – English

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Optometrija</i>
Valstybinis kodas	612F36001
Studijų sritis	Fiziniai mokslai
Studijų kryptis	Fizika
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	pirmoji
Studijų forma (trukmė metais)	Nuolatinė (4)
Studijų programos apimtis kreditais	240
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Fizikos bakalauras
Studijų programos įregistravimo data	2009-08-31, Nr. 1-73

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Optometry</i>
State code	612F36001
Study area	Physical Sciences
Study field	Physics
Type of the study programme	University studies
Study cycle	first
Study mode (length in years)	Full-time (4)
Volume of the study programme in credits	240
Degree and (or) professional qualifications awarded	Bachelor of Physics
Date of registration of the study programme	31-08-2009, No. 1-73

Studijų kokybės vertinimo centras

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I. INTRODUCTION

1.1. Background of the evaluation process

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

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

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

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

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

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

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

1.2. General

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

No.	Name of the document
1	Draft of Quality of Studies Management document of Šiauliai University.
2	Final theses of <i>Optometry</i> (BA) students,

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

Since 2015, the study programme of Optometry is administrated by the Department of Environmental Research and Physics of the Faculty of Natural Sciences in cooperation with Optometry Study Programme Committee and the Faculty Study Programmes Evaluation Committee. The Optometry programme Committee represented mainly by the teaching staff of the Department of Environmental Research and Physics, coordinates this unique study programme in relation to needs of the national labour market. A major part of study subjects delivers teaching staff of the Faculty of Natural Sciences and the rest part delivers teachers from five other University subdivisions: Informatics, Mathematics & e-Studies Institute, Technology & Natural Sciences Faculty, Faculty of Social Sciences, Faculty of the Humanities, and Faculty of Education. The potential to develop competences well meeting the demands of the labour market is a key factor of the programme attractiveness to the youth of today.

Launched in 2009 and evaluated by the international panel of experts in 2013 the study programme Optometry accredited for 3 years recommending coordinators of the programme to

improve programme aims and learning outcomes and to justify a qualification of teaching staff in the field of Physics. Since 2013, the changes made in the study programme are discussed in Self Evaluation Report (SER) chapters “2.1 Aims and Learning Outcomes of the Programme” (SER 2.1, 27) and “2.3 Teaching staff” (SER 2.3). This SER prepared by the programme’s Self-Evaluation Group consisting of five staff members, one graduate, and one student of the study programme Optometry.

Following the analysis of the SER, the International group of experts henceforth the Review Team, visited the Department of Environmental Research and Physics of the Faculty of Natural Sciences at Šiauliai University on Monday, October 5, 2015. The visit involved meetings with the following groups: senior administrative staff; staff responsible for preparation of the SER; teaching staff; students of all years of study; alumni; stakeholders and social partners. The Review Team had the opportunity to visit the laboratories, classrooms and library and familiarized themselves with a number of documents and with students’ final thesis, presented by University representatives. All the people involved in the process of evaluation were open and cooperative. When needed, the Review Team was fully supported by an English interpreter. The Review Team would like to thank everyone involved in organizing the event and participating in the meetings. After the visit, the Review Team discussed and agreed upon the content of the report, which represents the consensual view of the Review Team.

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 5/10/2015.

- 1. Dr. Terence Clifford-Amos (team leader),** *Université Catholique de Lille/International Consultant, UK*
- 2. Prof. dr. Janis Spigulis,** *Head of Biophotonics laboratory, professor at department of Physics of University of Latvia, Latvia*
- 3. Dr. Rynno Lohmus,** *Institute of Physics, University of Tartu, Estonia*
- 4. Prof. dr. Artūras Jukna,** *Head of Department of Physics of Vilnius Gediminas Technical University, Lithuania*
- 5. Dr. Danas Ridikas,** *Research Reactor Officer at IAEA, Austria*
- 6. Mr Benas Gabrielis Urbonavičius,** *Ph.D. student of Materials Engineering at Kaunas University of Technology, Lithuania*

II. PROGRAMME ANALYSIS

2.1. Programme aims and learning outcomes

The programme *Optometry* (BA) evinces a very broad aim in the field of Physics and Optometry. The aims are reached through fifty-four study modules delivered to students and meeting international standards on Optometry and pursuing studies of interdisciplinary master degree related mostly to Optometry or Vision Science. The aims are implemented through five learning outcomes subdivided into ten subsections, describing clearly the expected abilities enabling the graduates to pursue and contribute positively to labour market demands in Lithuania. The learning outcomes sufficiently address cognitive domains in learning of theoretical/experimental physics, optometry, towards developing the ability to perform research work, in development of personal, professional, communication, language, and self-development

skills. The learning outcomes are reflected in the respective subject areas. The programme *Optometry* embraces the training of specialists who are capable of pursuing master studies on vision science (SER 2.1, 15). *Optometry* is framed according to unified standards of European education in optometry worked out by the European Association of Optics. The brief information about the study programme *Optometry* is presented on the University website and it is publicly accessible: http://www.su.lt/index.php?option=com_content&view=article&layout=edit&Itemid=1390&id=4402&lang=lt (in Lithuanian).

The study programme aims reflects the professional requirements and public needs and it has clear professional orientation. The demand for optometrists in Lithuania is constantly growing and graduates of this study programme can partly fill up the gap of the labour market. However, the Review Team and the programme administrators are confident that optometrists of Šiauliai University meet the needs of Lithuania and European Association of Optics, as well as needs of the labour market in Lithuania. As the SER states, graduates are able to work in academic institutions, state service and production enterprises (SER, 2.1, 15).

During the visit the Review Team noticed that study programme administrators were endeavoring to cope with demographic problems, obviously those related to decreasing number of students in Lithuania. The programme team has proposed partnerships and international strategies, including an eventual joint study programme together with Lithuanian University of Health Sciences on the subject of Optometry.

The six-year educational experience in the field of *Optometry* and last improvements of study programme renders this programme especially interesting from an academic point of view as it demonstrates a good way of synergizing Physics and Optometry in a single study programme.

The study of Physics comprises fifteen interrelated subjects and study of Optometry – fourteen related subjects out of forty-four subjects (except optional modules) of the programme. The programme's aims and learning outcomes look fully consistent with the type and level of studies and the level of qualifications offered. The study programme *Optometry* offers the qualification of Bachelor in Physics, which is not fully in line with the programme's name. However, according to the Classification of subjects by Field of Study in Lithuania the *Optometry* could only be registered in the field of Physics with qualification of bachelor of Physics.

2.2. Curriculum design

With regard to legal requirements, relating to academic credit allocation, core and elective subjects, final project and student placement, Table 2.3 of the SER sets out the compliance of the study programme plan. This plan has been revised according to the Review Team recommendations given in 2013. The plan also follows the Dublin Descriptors, the European Qualifications Framework for Lifelong Learning, the decrees No. 535 and 1749 of the Government of the Republic of Lithuania as well as the Law on Higher Education and Research of the Republic of Lithuania.

By examining the subject modules, the Review Team found that modules *Anatomy and physiology of visual system, Astronomy, Computational Physics, English for Specific Purposes, Eye Disease, Eye Optics and Vision Correction, General chemistry, Genetics, History of Physics, Human Anatomy and Physiology, Information Technologies, Instrumental Optics, Introduction to Algorithms and Programming, Management, Solid State Physics, Statistical Physics, Mathematical Methods in Physics, Modern Optometric Equipment, Molecular Physics, Neurophysiology of Vision System, Nuclear and Elementary Particle Physics, Physics of Laser, Problems and Methodology of Optometry, Probability Theory and Mathematical Statistics,*

Russian for Specific Purposes (B2), *Vision Therapy* – have academic independence and reveal no repetition. However, the rest of modules need to be improved, e.g. some of them contain references older than 30 years (*Biomedical Signal Processing* (2 options of the main references, and one of them issued in 1984), *Databases and its Management*, *Differential Equations* (2 references, out of 7, issued in 1968 and 1969), *Electronics* (3 positions on a list of the main references issued in 1987, 1980, 1986), *Mechanics* (1 position on a list of the main references issued in 1980, and one of them issued in 1984 and 1 position (out of 2) on a list of additional references issued in 1973), *Optical Technologies* (1 position on a list of the main references issued in 1986), or a year of issue is not presented in the modules *Contact Correction*, *The Evolution of Vision Correction*, and *The Psychology of Communication*.

The content of the modules *Electricity and Magnetism* and *Hydrogen Energetics* given in Lithuanian language differs from that one given in English. Several titles of themes in syllabus are missing, e.g. theme No. 3.2 (page 30 in Annex 1), No. 4.1 (see page 72 in Annex 1). There is a minor repetition of the study themes in several of study modules: e.g. some themes in module *Electromagnetic Fields and Waves* partly repeats themes of module *Electricity and Magnetism*, themes of *Optics* partly repeats *Electromagnetic Fields & Waves* and *Electricity & Magnetism*, themes of *Higher Mathematics* partly repeats themes in *Differential Equations*, themes of *Quantum Physics* partly repeats themes of *General Chemistry*, module *Research data processing and reporting of results* partly repeats module *Methodology of General Physics Laboratory*.

The study programme *Optometry* is of 240 ECTS credits. Curriculum consists of general university study modules (21 ECTS credits), modules directly related with the study area (194 ECTS). The programme also includes free selective (optional) modules of 12 ECTS credits, two practices (15 ECTS credits) and Bachelor theses (12 ECTS credits). Study modules related with Physics take 90 ECTS credits and ones related with Optometry take 60 credits. The content of the study programme looks consistent with the type and level of the studies, assuming that the degree awarded is Bachelor of Physics. Assuming an importance of laser technologies in curing of eyes diseases and laser potential in replacement of the mechanical cutting tools, the Review Team recommends including the study module *Laser Physics* as a compulsory subject in the curriculum. The study module *Laser Physics* should cover themes related with physics of lasers used for eye surgery and/or diagnostics, e.g. femtosecond-pulsed lasers and excimer lasers.

The learning outcomes of study modules of the *Optometry* programme are linked to the programme learning outcomes. The subject content and teaching methods illustrate how students could achieve the intended learning outcomes. Students take courses of 60 ECTS credits per academic year (30 ECTS credits/semester). The study time allocated for the *Optometry* is divided into two parts: 50.4 percent of the study time for the students individual work 4 and 9.6 percent of the study time as contact hours and (consisting of thirty eight percent of contact hours allocated for lectures, twenty-two percent for the problems solving, twenty-seven percent for lab works and thirteen percent for consultations).

Learning outcomes adequately reflect the scope of the whole programme. Furthermore, the content of the programme well reflects the latest achievements in Optometry and introduces the most modern technology features. On the other hand, the practices are mostly related to Optometry with comparatively weak accent on Physics. Coverage of the latest achievements in Physics looks comparatively weaker. To improve it, the Review Team recommends the study programme management group to establish regular discussions of the teaching staff with social partners and stakeholders, who are already providing the latest equipment for students' Final thesis and Practices.

2.3. Teaching staff

There are twenty-seven tutors, who mainly have full-time positions at Šiauliai University. Some of them are part-time employers coming from Lithuanian University of Health Sciences in Kaunas, Vytautas Magnus University in Kaunas or Vilnius University in Vilnius to give specific courses on Optometry. All members of the teaching staff have on average twenty years' practical work/pedagogical experience, 80 scientific publications during the last 5 years and they participated in more than 50 national and international conferences (SER 2.3, 60). More than half of the staff holds the position of professor/associate professor (SER 2.3, 61). Nearly 83 percent have a doctoral qualification, thus meeting the legal requirements for the teaching staff.

The latest technology in the field of Optometry is strongly supported by social partners and stakeholders for keeping the teaching staff qualification in this field. The teaching staff turnover is sufficient for the study programme whereas the ratio of teaching staff over the number of students is less than 0.1 (SER, Table 2.4). Globally, the average age of the teaching staff ensures the study programme sustainability: there are five staff members under forty, and one professor and five associated professors/lecturers are over sixty years old. However, as it was noticed by the Review Team during the meeting, most members of the teaching staff might need to improve their English skills.

One person in the study programme delivers two, three or even more courses in different fields (e.g. courses: *Bachelor Degree Work, Optometrist Practice 1, Optometrist Practice 2, Problems and Methodology of Optometry, Research data processing and reporting of results, Solid State Physics, Sight Therapy* are delivered by one person, or *Computational Physics Mathematical Methods in Physics, Methodology of General Physics Laboratory, Nuclear and Elementary Particle Physics* are also delivered by one person (see Annex 2)). Therefore, the Review Team believes that the number of the teaching staff is not adequate for achieving of the learning outcomes related with Physics.

The teaching staff is obliged to carry out research and to coordinate/participate in research and technical development national and international projects. Research outcomes are commonly operational in terms of research-informed teaching. However, not all staff members are able to indicate in a list of publications, that is five scientific papers (what is requested by the CV form, see Annex 3) published in journals of high impact index per last five years. The participation of the teaching staff in the scientific international/national conferences is not sufficiently supported by the Faculty/University (SER, Annex 3). Local research in vision science has the potential to grow, based on successful eye movement tracking studies at the Biomedical Engineering Centre.

The low number of scientific publications on subject of Physics in high impact journals, monographs, internships and limited attendance of the Physics related conferences and low international mobility rate indicate the moderate qualifications of the teaching staff in the field of Physics. A high subject specialism associated with the teaching staff related to subject of Optometry is strongly supported by social partners. The scientific research in the field of Physics, publishing activity in peer reviewed journals and mobility of the teaching staff should be more encouraged and supported by Faculty/University as these aspects are directly related to the pedagogical development, the latest scientific results and knowledge transfer to the students.

2.4. Facilities and learning resources

The study programme *Optometry* mostly uses the facilities and learning resources of Faculty of Technology and Natural Sciences. Auditoria of the Faculty meet the requirements of modern

teaching (equipped with stationary or portable computers, projector, and wireless internet access - SER, 2.4, 77). Teaching capacities are in most cases sufficient for lectures and students' practical work. Some small laboratories (e.g., special laboratory of Hydrogen Energy) participate in study process, as well. The students training laboratories on subject of Optometry are well-equipped with the modern experimental stands for students' practical training on optical technologies and on examination of vision. However, the laboratories facilities and resources used for the teaching of Physics subjects meet the minimum level and therefore need of upgrading, especially experimental technique and devices used for students' laboratory works on Physics.

The Review Team received copies of invoices confirming that in 2012/13 Šiauliai University bought some new equipment/facility for the study of Physics, spending large sums of project money. Nevertheless, during the site visit new pieces of equipment/facility were not transparent in the Physics laboratories. Thus, the Review Team can only confirm that, substantially, the 'physics' resources they did see and record appeared somewhat out of date.

Some University investments support the programme *Optometry*, e.g. University have invested more than twenty two thousand euros to the equipment in the Hydrogen Energy laboratory, which is related with Physics; and together with social partners the University have invested to the installation for other laboratories related with subject of Optometry. The social partners provide a very good laboratory infrastructure for the students' practical training on subject of Optometry.

All the students of the study programme *Optometry* perform their work placement at Šiauliai University or in laboratories of the Social partners working in the field of Optometry. Students have full access to the Library resources (books, journals, databases) from which any computer located in 15-18 working places can reach the University network. This also facilitates the use of e-books. The University library prescribes 34 data bases with more than 24 thousand electronic publications available. Šiauliai University subscribes to over seven thousand research journals, more than eleven thousand monographs, reports/conference proceedings (SER, 2.4, 83). Students have also distant access to above mentioned resources from their own computer using virtual network possibilities. All mentioned library resources look appropriate for reaching programme's aims and learning outcomes.

2.5. Study process and students' performance assessment

Admission of students to the programme *Optometry* is based on the grades in secondary school/gymnasium maturity examination and annual scores. The admission score includes scores on Physics (weight coefficient of 0.4), Mathematics (0.2), Lithuanian language & literature (0.2) and on one of extra subject final examination (0.2). In 2014, the admission score calculation scheme changed to 1-10 scale from the previously used 1-20 scale. The University website and the Joint Admission Network Association of Lithuanian Higher Education (LAMABPO) informational websites and booklets give detailed information on admission procedure and necessary documents.

The admission average-score of those who chose the study programme *Optometry* have gradually decreased starting with 13.2 (2010) and ending with 12.8 (2013) out of maximum 20. Within this period, the number of students who have chosen the study programme *Optometry* also decreased from 78 (2010) to 43 (2014) (SER, 2.5, Table 2.10). The admission rules are consistent with the nature of the studies and skills required from the students. In a period of five academic years (2010–2015), 89 students entered the study programme in the second/third year

of studies. A drop-out of students was negligible - less than five percent. These figures indicate that programme *Optometry* has its own place due to its uniqueness. However, the Review Team encourages the study programme management to develop action plan for survival in the overall student demographic situation.

The practical realization of the study programme *Optometry* aims involves a wide-range of teaching and learning methods including lectures, projects, practical works, individual-studies and laboratory works. However, virtual learning (Moodle) system is not popular among the students and their teachers – its usage was found very limited. The Review Team strongly advises the study programme management to encourage its using and integrating it to the study process.

An important part of the studies is the Final Thesis, under the supervision of a senior staff member. During the preparation, students use gained skills and knowledge as well as learning from practice for composing this final work. The Final Thesis is defended at the end of the studies before a Commission. Requirements for the Final Thesis are clearly described (SER, 2.5, 122).

Four out of twenty-one subjects of Final thesis are related with subject of Physics and others are related with subjects of *Optometry*. In the third year of studies, students start to participate in research activities working on their Final thesis. The Final Thesis, its defence and assessment procedures meet the Bachelor qualification requirements (SER, 2.5, 121). The topics for students' Final Theses are related to the scientific interests of the University teaching staff (SER, 2.5, 125).

During the meeting with students, the Review Team noticed that very few of the third or fourth year students were planning to continue their studies for Master's degree. Low motivation to continue studies based on the fact that major part of students have already work places and are happy working in the field of optometry.

Students have opportunities to participate in international mobility programmes for obtaining important experience and contacts. However, over the last three years period only three students of the study programme *Optometry* undertook mobility placement, travelling to Istanbul Aydin University in Turkey. This relatively low number in students' mobility is mostly related to difficulties matching the process of studies abroad and employment and private life in Lithuania. To solve this problem, the Review Team recommends that the study programme management encourage students' mobility by introducing new internal financial schemes.

Once per semester students can apply for scholarship for excellent academic achievements or social needs. In the case of the latter this amounts to ~114 euros per month for students living in want. The University can afford 4-6 scholarships in average per semester to students of programme *Optometry* (SER 2.5, 109). There are also so-called "contract students" whose studies are paid by companies under a contract on already active or further employment in this company.

The range and choice of assessment methods exploited vary between the courses. The University uses a formative assessment, according to the 10-point system, which takes into account multiple aspects of student performance (e.g. a report, report's presentations, and ability to answer questions related to subject, lab work performance and defence, as well as to solve problems in colloquiums) in addition to the final examination (cumulative). The knowledge-oriented students are provided with continuous feedback during the course. Students expressed their contentment

regarding knowledge assessment system, programme in general and student-teacher relationships.

The minority of graduates wish to continue their studies at Master level. Almost all graduates start their working careers right after the graduation or, especially those who enter the study programme from the second/third academic year of studies and have full-time jobs.

2.6. Programme management

Šiauliai University is implementing Quality Management System enabling to develop qualitative content of studies and study methods. The University Quality Management System consists of five levels: the Senate (discusses and approves the programmes); the Department of Strategic and Quality Management (designs/develops the system of study quality assurance); the Department of Studies (manages the study process, administers the study process) (SER 2.6, 130). At the level of Faculty of Technology and Natural Sciences, the quality of the programme informs the Faculty Council, Dean/vice-Dean, and Faculty Programmes Assessment Committee. The Faculty Council and the Faculty Study Committee are responsible for the functioning of the study quality (SER 2.6, 131). The Department of Environmental Research & Physics as well as the programme Committee of the study programme *Optometry* are in charge of implementing the study process and the programme's aims, respectively (SER 2.6, 132-133). Information concerning the quality of the *Optometry* programme comes from the teaching staff, Students' Representation Office and social partners.

All data on implementation of the study programme is stored in the Academic Information System database accumulating students' personal data, credits compulsorily accumulated over certain period of time and academic achievements. Surveys are organized by University Department of Studies (SER 2.6, 146) and students' participation is obligatory. Students are encouraged to express their opinion about the study modules for the collective improvement of programme. All members of the teaching staff can access the database and read students responses. However, the responsibilities for decisions and monitoring of the implementation of the *Optometry* programme could be articulated more clearly.

The outcomes of evaluations are collected by the Optometry Study Programme Committee. Assessment of teaching quality is one of academic emphasis, in that teacher evaluation tends to be more focused on lecturing than to research.

Social stakeholders are effectively involved into process of quality assessment/improvement of the study programme. The stakeholders collaborate with the Department, also suggesting students' themes for Final thesis, delivering lectures to students, evaluating students' level of readiness for practical work (SER, 2.5, 143).

During the interview with University administration, the administration submitted for experts' evaluation a draft of "Quality Management Guide of Šiauliai University". The document describes guidelines for development of strategic activities, management of sciences and arts, management of the human, material, financial resources, management of the internal and external communications, and management of the university infrastructure, documents and projects. This guide presents scheme of the University Quality Management System and model of interactions of different strategic components one with another. The development of "Quality Management Guide of Šiauliai University" has been funded by project UNI-Q-MAS (University Quality Management System) project No. VP1-2.1-ŠMM-04-K-02-003. The Quality Management system consists of 14 documents regulating University activities, including University strategy, studies, human resources, library and external communication. The Quality

Management Guide of the Faculty of Natural Sciences of Šiauliai University was not presented for experts' evaluation. Although, internal Study Quality Assurance System is in place at the University, however, the Review Team believes that further developing of more systematic approach in this field is necessary;

During the visit the Review Team became aware that the study programme administrators were endeavoring to cope with demographic problems, obviously those related to decreasing number of students in Lithuania. The programme team has proposed partnerships and international strategies, including an eventual joint study programme together with Lithuanian University of Health Sciences on the subject of Optometry. However, the Review Team believes there should be far stronger survival and strategic endeavours, robust marketing and a sense of urgency.

During the discussions with programme's administrators, the Review team noticed that the recommendations for the programme's management from previous evaluation have been used for the improvement of the programme only to some extent. In particular, recommendation No. 4 (Evaluation report of *Optometry* 612F36001 Study Programme at Šiauliai University, done in 2013): "to take action seeking to ensure, that all students have achieved the intended learning outcomes in the field of Physics, particularly those admitted directly in the third year. No. 6: "to pay attention to the qualification and number of the teaching staff, especially in the field of Physics", No. 7: "to increase the numbers of the staff and students participation in international mobility programmes" and No. 8: "to implement more systematic approach in the internal quality assurance". The programme's administrators need to take more efforts to implement further experts recommendations balancing the study programme with respect to professional orientation of students awarded with Bachelor of Physics degree, especially if programme's graduates intend to apply for Master degree studies.

2.7. Examples of excellence *

- Excellent employment rate of graduates;
- The possibility to use crèche for library visitors with children;
- The social partners provide a very good laboratory infrastructure and equipment for the students' practical training on subject of Optometry.

III. RECOMMENDATIONS

It is recommended to

1. Take more efforts further balancing the study programme in respect to professional orientation of students awarded with Bachelor of Physics degree. Review the implementation and redefine the titles of practices “Practice of an Optometrist 1” and “Practice of an Optometrist 2” aligning with the requirements for qualification of Bachelor of Physics and decreasing a risk that students do not reach the basic level of knowledge in Physics (especially if programme’s graduates would expect to apply for Master degree studies);
2. Review and update the lists of academic references of some study modules, namely *Biomedical signal processing, Databases and its management, Differential equations, Electronics, Mechanics, Optical technologies, Contact correction, The evolution of vision correction, and The psychology of communication*;
3. Avoid/minimize repetitions of study themes in study modules, namely in *Optometry, Electromagnetic Fields and waves, Electricity and magnetism, Optics, Electromagnetic fields and waves, Higher mathematics, Differential equations, Quantum physics, General chemistry, Research data processing and reporting of results, Methodology of general physics laboratory*;
4. Increase the number of teaching staff ensuring the full achievement of the intended learning outcomes related to Physics involving visiting (national/international) lecturers, and in a long-term perspective to pay more attention to the recruitment of young teachers delivering lectures in Physics;
5. Encourage the international activities and participation in conferences of the teaching staff;
6. Strengthen knowledge of English for the teaching staff and students;
7. Improve the infrastructure for studies (teaching and learning equipment) in Physics;
8. Encourage participation of students in the mobility programmes;
9. Finalize the documentation and implementation of internal Study Quality Assurance system in Šiauliai University;
10. Build a clear plan of the programme’s survival actions concerning the overall number of entrants decreasing in Lithuania;
11. Develop further local research in vision science.

IV. SUMMARY

Programme aims and learning outcomes

- The aspiration to educate high quality optometrists for Šiauliai and other regions of Lithuania and finding the unique profile of the programme;
- A periodical review of the aims and learning outcomes based on the public needs and the needs of the local and regional labour market. The optometry well developed in the Šiauliai region;
- The subject of study and anticipated learning outcomes of the *Optometry* programme are publicly accessible via internet;
- The name of the programme *Optometry* is not fully in line with the offered qualification. (Bachelor of Physics). However, according to the Classification of subjects by Field of Study in Lithuania the *Optometry* could only be registered in the field of Physics with qualification of bachelor of Physics.

Curriculum design

- The content of the study programme *Optometry* is consistent with the Bachelor level and type of studies;
- The structure of the curriculum is logical; study direction subjects spread evenly. The changes of the programme, namely the expanding of the curriculum with the modules on Physics for even distribution of Physics and Optometry subjects starting with the fifth semester of studies was recommended by the Review Team;
- The implementation of practices “Practice of an Optometrist 1” and “Practice of an Optometrist 2” should be reviewed as it does not seem to fully meet requirements for Bachelor of Physics and rises the risk that students do not reach the basic knowledge in Physics affecting their possibility to access Master’s degree;
- The bibliography recommended for some study modules, namely *Biomedical Signal Processing, Databases and its Management, Differential Equations, Electronics, Mechanics, Optical Technologies, Contact Correction, The Evolution of Vision Correction*, and *The Psychology of Communication*, need to be reviewed;
- There are some repetitions of study themes in modules of *Optometry*: *Electromagnetic Fields and Waves* partly repeats themes of *Electricity and Magnetism*; *Optics* partly repeats *Electromagnetic Fields & Waves* and *Electricity & Magnetism*; *Higher Mathematics* partly repeats *Differential Equations*, *Quantum Physics* partly repeats *General Chemistry*, *Research data processing and reporting of results* partly repeats *Methodology of General Physics Laboratory*.

Teaching staff

- The qualification of the teaching staff meets the legal requirements and is adequate to ensure learning outcomes of study subjects of *Optometry*;
- The staff of the programme consists of experienced and motivated teachers. Students are in good relationships with majority of the teaching staff;
- The number of teaching staff related with subjects of Physics should be increased to ensure the full achievement of the intended learning outcomes related to Physics;
- The international activities, participation in conferences of the teaching staff could be more encouraged and supported by the faculty/university;
- Some of the teaching staff members need to strengthen their knowledge of English;
- The Review Team recommends in a long-term perspective to pay attention to the recruitment of young teachers delivering lectures on subjects of Physics.

Facilities and learning resources

- The material resources of the study programme are good for reaching the intended learning outcomes;
- The Optometry labs are equipped with modern technique adequate for training of optometrists;
- The University library is one of the most modern libraries in Lithuania. Data bases related to the study modules, textbooks, periodical publications are adequate and accessible;
- There is a possibility to order books or periodic journals in other libraries of Lithuania;
- The possibility to use crèche for library visitors with kids was acknowledged;
- The lab facilities and resources used for the study of Physics subjects are just “basic” and some of them outdated.

Study process and students’ performance assessment

- The level of academic and social support at Šiauliai University is sufficient to respond needs of students;
- The major part of programme’s graduates is employed in optometry related companies and firms supporting excellent employment records;
- Knowledge-oriented and highly motivated programme’s students;
- Weak usage of opportunities to participate in students’ mobility programmes;
- Need to strengthen students’ knowledge of English.

Programme management

- Šiauliai University has internal Study Quality Assurance System, which can ensure the study quality of *Optometry* programme;
- Information and data on the implementation of the programme *Optometry* are collected and analyzed;
- The Department of Environmental Research and Physics of Faculty of Natural Sciences has close relationships with social partners, stakeholders and employers;
- The responsibilities for decisions and monitoring of the implementation of the *Optometry* programme are allocated, but they could be articulated more clearly;
- As students’ number drastically decreases, the Review Team recommends study programme management to build a robust survival action plan of the programme *Optometry*, together with a strategy on marketing;
- Although internal Study Quality Assurance System is in place at the University, further developing of more systematic approach in this field is necessary;
- The study programme committee needs to take more efforts further balancing the study programme in respect to professional orientation of students awarded with Bachelor of Physics degree, especially if programme’s graduates intend to apply for Master degree studies;
- The recommendations for the programme’s management from previous evaluation have been used for the improvement of the programme only to some extent, in particularly: see Evaluation report of *Optometry* (612F36001 Study Programme at Šiauliai University, done in 2013, recommendation No. 4: “to take action seeking to ensure, that all students have achieved the intended learning outcomes in the field of Physics, particularly those admitted directly in the third year. No. 6: “to pay attention to the qualification and number of the teaching staff, especially in the field of Physics”, No. 7: “to increase the numbers of the staff and students participation in international mobility programmes” and No. 8: “to implement more systematic approach in the internal quality assurance”.

V. GENERAL ASSESSMENT

The study programme *Optometry* (state code – 612F36001) at Šiauliai University is given **positive** evaluation.

Study programme assessment in points by evaluation areas.

No.	Evaluation Area	Evaluation of an area in points*
1.	Programme aims and learning outcomes	4
2.	Curriculum design	3
3.	Teaching staff	2
4.	Facilities and learning resources	3
5.	Study process and students' performance assessment	3
6.	Programme management	2
	Total:	17

*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:	Dr. Terence Clifford-Amos
Grupės nariai: Team members:	Prof. dr. Janis Spigulis
	Dr. Rynno Lohmus
	Prof. dr. Artūras Jukna
	Dr. Danas Ridikas
	Mr Benas Gabrielis Urbonavičius

**ŠIAULIŲ UNIVERSITETO PIRMOSIOS PAKOPOS STUDIJŲ PROGRAMOS
OPTOMETRIJA (VALSTYBINIS KODAS – 612F36001) 2015-11-27 EKSPERTINIO
VERTINIMO IŠVADŲ NR. SV4-307 IŠRAŠAS**

<...>

VI. APIBENDRINAMASIS ĮVERTINIMAS

Šiaulių universiteto studijų programa *Optometrija* (valstybinis kodas – 612F36001) vertinama **teigiamai**.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	4
2.	Programos sandara	3
3.	Personalas	2
4.	Materialieji ištekliai	3
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	2
	Iš viso:	17

* 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

- Puikus absolventų įsidarbinimo lygis.
- Galimybė bibliotekos lankytojams palikti vaikus darželyje.
- Socialiniai partneriai suteikia labai gerą laboratorijų infrastruktūrą ir įrangą studentų atliekamiems optometrijos dalyko praktiniams darbams.

IV. SANTRAUKA

Programos tikslai ir studijų rezultatai

- Siekiama rengti aukštos kokybės optometrinius Šiaulių ir kitiems Lietuvos regionams ir rasti unikalų programos profilį;
- remiantis visuomenės, vietos ir regioninių darbo rinkų poreikiais, periodiškai įvertinami programos tikslai ir studijų rezultatai. Optometrijos mokslas gerai išvystytas Šiaulių regione;
- *Optometrijos* programos studijų dalykas ir numatomi studijų rezultatai yra viešai skelbiami internete;

- studijų programos pavadinimas *Optometrija* nevisiškai atitinka suteikiamą kvalifikaciją (fizikos bakalauros). Pagal Lietuvos studijų kryptių klasifikatorių, *Optometrija* gali būti registruojama tik fizikos srityje; suteikiama fizikos bakalauro kvalifikacija.

Programos sandara

- Studijų programos *Optometrija* turinys atitinka bakalauro studijų lygį ir studijų tipą.
- Programos sandara yra logiška; studijų krypties dalykai išdėstyti nuosekliai. Vertinimo grupė rekomenduoja atlikti kai kuriuos programos pakeitimus, t. y. praplėsti programą, pridėdant fizikos modulį, kad nuo penkto semestro tolygiau pasiskirstytų fizikos ir optometrijos dalykai.
- Praktikos „Optometrininko praktika 1“ ir „Optometrininko praktika 2“ įgyvendinimą reikia peržiūrėti, nes ji atrodo ne iki galo atitinkanti fizikos bakalauro laipsniui keliamus reikalavimus ir kelia pavojų, kad studentai neįgis pagrindinių fizikos žinių, o tai turės įtakos jų galimybėms įstoti į magistrantūrą.
- Būtina peržiūrėti bibliografiją, rekomenduojamą kai kuriems studijų moduliams, būtent *Biomedicininį signalų apdorojimas, Duomenų bazės ir jų valdymas, Diferencialinės lygtys, Elektronika, Mechanika, Optinės technologijos, Kontaktinė korekcija, Akies optika ir regos korekcija, Bendravimo psichologija*.
- *Optometrijos* moduluose kartojami kai kurios studijų temos, pvz., modulį *Elektromagnetiniai laukai ir bangos* iš dalies kartoja *Elektra ir magnetizmas*; modulį *Optika* iš dalies kartoja *Elektromagnetiniai laukai ir bangos* bei *Elektra ir magnetizmas*; modulį *Aukštoji matematika* iš dalies kartoja *Diferencialinės lygtys*; *Kvantinė fizika* iš dalies kartoja *Bendroji chemija*, modulį *Tyrimo duomenų apdorojimas ir rezultatų pateikimas* iš dalies kartoja *Fizikos praktikumo metodika*.

Dėstytojai

- Dėstytojų kvalifikacijai keliami reikalavimai atitinka teisinius reikalavimus ir yra tinkami studijų programos *Optometrija* dalykų studijų rezultatams užtikrinti.
- Programos personalas sudarytas iš patyrusių ir motyvuotų dėstytojų. Studentų santykiai su dauguma dėstytojų yra geri.
- Fizikos dalykus dėstančių dėstytojų skaičių reikia padidinti, siekiant užtikrinti, kad numatomi studijų rezultatai, susiję su fizika, būtų visiškai pasiekti.
- Fakultetas / universitetas galėtų labiau skatinti ir remti dėstytojų tarptautinę veiklą bei dalyvavimą konferencijose.
- Kai kuriems dėstytojams reikėtų pagerinti anglų kalbos žinias.
- Ekspertų grupė ilgalaikėje perspektyvoje rekomenduoja atkreipti dėmesį į būtinybę samdyti jaunus dėstytojus, kurie skaitytų fizikos dalykų paskaitas.

Materialieji ištekliai

- Studijų programos materialieji ištekliai yra geri ir tinka numatomiems studijų rezultatams pasiekti.
- Optometrijos laboratorijose įrengta šiuolaikiška technika, tinkama optometrininkams rengti.
- Universiteto biblioteka – viena moderniausių Lietuvoje. Su studijų moduliais, vadovėliais, periodiniais leidiniais susijusios duomenų bazės tinkamos ir prieinamos.
- Yra galimybė užsisakyti knygų arba periodinių leidinių kitose Lietuvos bibliotekose.
- Bibliotekos lankytojams su vaikais suteikiama galimybė juos palikti vaikų darželyje.
- Fizikos dalykų studijoms naudojama tik bazinė laboratorijų infrastruktūra ir baziniai ištekliai, kai kurie iš jų yra pasenę.

Studijų eigos ir studentų pažangumo vertinimas

- Šiaulių universiteto teikiamos akademinės ir socialinės paramos pakanka studentų poreikiams patenkinti.
- Didžioji dalis šios studijų programos absolventų įsidarbina su optometrija susijusiose bendrovėse ir įmonėse, todėl įsidarbinimo rezultatai – puikūs.
- Į žinias orientuoti ir itin motyvuoti programos studentai.
- Menkai išnaudojamos studentų dalyvavimo judumo programose galimybės.
- Būtina gerinti studentų anglų kalbos žinias.

Programos vadyba

- Šiaulių universitetas turi vidinę studijų kokybės užtikrinimo sistemą, laiduojančią studijų programos *Optometrija* kokybę.
- Renkama ir analizuojama informacija bei duomenys apie studijų programos *Optometrija* įgyvendinimą.
- Technologijų ir gamtos mokslų fakulteto Aplinkotyros ir fizikos katedra palaiko glaudžius ryšius su socialiniais partneriais, socialiniais dalininkais ir darbdaviais.
- Atsakomybė už sprendimus ir studijų programos *Optometrija* įgyvendinimo stebėseną yra paskirstyta, tačiau galėtų būti aiškiau apibrėžta.
- Drastiškai mažėjant studentų skaičiui, vertinimo grupė studijų programos vadybai rekomenduoja skubiai parengti studijų programos *Optometrija* gelbėjimo veiksmų planą ir rinkodaros strategiją.
- Nors universitete veikia vidinė studijų kokybės užtikrinimo sistema, būtina toliau plėtoti sistemingesnę požiūrį į šią sritį.
- Studijų programos komitetui reikia dėti daugiau pastangų, siekiant subalansuoti studijų programą fizikos bakalauro laipsnį įgijusių studentų profesinio orientavimo požiūriu, ypač jei baigusieji programą ketina stoti į magistrantūrą.
- Studijų programos rengėjai į ankstesnio vertinimo rekomendacijas dėl programos vadybos gerinimo atsižvelgė tik iš dalies, žr. 2013 m. „Šiaulių universiteto studijų programos *Optometrija* (valstybinis kodas – 612F36001) veiklos vertinimo išvados“, rekomendacija Nr. 4: „Panaudoti visas reikiamas priemones siekiant užtikrinti, kad visi studentai (ypatingas dėmesys turėtų būti skiriamas tiems, kurie priimami į trečią kursą) pasiektų numatomus studijų rezultatus, susijusius su fizika“; Nr. 6: „Atkreipti dėmesį į studijų programoje dėsančių dėstytojų skaičių ir kvalifikaciją, ypač tu, kurie dėsto fizikos studijų dalykus“; Nr. 7: „Padidinti tarptautinio judumo programose dalyvaujančių dėstytojų ir studentų skaičių“; Nr. 8: „Vykdėti sistemingesnę vidinę studijų kokybės užtikrinimą“.

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III. REKOMENDACIJOS

Rekomenduojama:

1. Stengtis geriau subalansuoti studijų programą studentų, kurie įgyja fizikos bakalauro laipsnį, profesinės orientacijos požiūriu. Įvertinti įgyvendinimą ir perkurti praktikų „Optometrininko praktika 1“ ir „Optometrininko praktika 2“ pavadinimus, priderinant prie fizikos bakalauro kvalifikacijai keliamų reikalavimų. Taip sumažėtų pavojus, kad studentai neįgis pagrindinių fizikos žinių (ypač tie, kurie planuoja stoti į magistrantūrą).

2. Peržiūrėti ir atnaujinti studijų modulių akademinių pavadinimų sąrašą, būtent *Biomedicininį signalų apdorojimas, Duomenų bazės ir jų valdymas, Diferencialinės lygtys, Elektronika, Mechanika, Optinės technologijos, Kontaktinė korekcija, Akies optika ir regos korekcija, Bendravimo psichologija*.
3. Vengti arba sumažinti moduliuose pasikartojančių studijuojamų temų, būtent *Optometrija, Elektromagnetiniai laukai ir bangos bei Elektra ir magnetizmas, Optika ir Elektromagnetiniai laukai ir bangos, Aukštoji matematika ir Diferencialinės lygtys, Kvantinė fizika ir Bendroji chemija, Tyrimo duomenų apdorojimas ir rezultatų pateikimas* bei *Fizikos praktikumo metodika*.
4. Siekiant užtikrinti, kad būtų visiškai pasiekti su fizika susijusių studijų numatomi rezultatai, reikia padidinti dėstytojų, įskaitant vizituojančius (vietinius ar tarptautinius) lektorius, skaičių, o ilgalaikėje perspektyvoje skirti daugiau dėmesio jaunų dėstytojų, skaitančių fizikos paskaitas, įdarbinimui.
5. Skatinti dėstytojų tarptautinę veiklą ir dalyvavimą konferencijose.
6. Gerinti dėstytojų ir studentų anglų kalbos žinias.
7. Pagerinti fizikos studijų infrastruktūrą (dėstymo ir studijų įrangą).
8. Skatinti studentus dalyvauti judumo programose.
9. Užbaigti Šiaulių universiteto vidinės Studijų kokybės užtikrinimo sistemos dokumentų rengimą ir sistemos įdiegimą.
10. Sukurti aiškų programos išlikimo veiksmų planą, susijusį su Lietuvoje bendrai mažėjančiu stojančiųjų į aukštąsias mokyklas skaičiumi.
11. Toliau plėtoti vietinius regos mokslo tyrimus.

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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)