



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Šiaulių valstybinės kolegijos
**STUDIJŲ PROGRAMOS "INFORMACINIŲ SISTEMŲ
TECHNOLOGIJA" (valstybinis kodas – 653E15005)
VERTINIMO IŠVADOS**

**EVALUATION REPORT
OF "INFORMATION SYSTEMS TECHNOLOGY" (state code -
653E15005) STUDY PROGRAMME
at Šiauliai State College**

Review' team:

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Išvados parengtos anglų kalba
Report language – English

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	Informacinių sistemų technologija
Valstybinis kodas	653E15005
Studijų sritis	Technologijos mokslai
Studijų kryptis	Informatikos inžinerija
Studijų programos rūšis	Koleginės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (3); ištęstinė (4)
Studijų programos apimtis kreditais	180
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Informacinių sistemų inžinerijos profesinis bakalauras
Studijų programos įregistravimo data	2004

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	Information systems technology
State code	653E15005
Study area	Technological studies
Study field	Informatics Engineering
Type of the study programme	College studies
Study cycle	First
Study mode (length in years)	Full-time (3); part-time (4)
Volume of the study programme in credits	180
Degree and (or) professional qualifications awarded	Professional Bachelor in Information systems Engineering
Date of registration of the study programme	2004

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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.	Evaluation Report of Information System Technology Study Programme at Siauliai State College (SVK), Vilnius, 2012.
2.	List of the College study programmes 2016-2017.
3.	Organisational Structure of SVK.
4.	Development strategy of the college 2011-2020 (in Lithuanian language).

The basis for the evaluation of the study programme is the Self-evaluation Report (hereafter, the SER), prepared in 2016, its annexes, the relevant legal acts, and the site visit of the Review

Team (RT) to SVK on 25 April 2017. The visit incorporated all required meetings with different groups: the administrative staff / senior management of the SVK, staff of the Informatics Engineering Department, responsible for preparing the self-evaluation documents, teaching staff, students of all years of study, graduates and employers. The RT evaluated various support services (classrooms, laboratories, library, computer facilities), examined students' graduation theses, and various other materials. After the RT discussions and additional preparations of conclusions and remarks, introductory general conclusions of the visit were presented. After the visit, the RT met to discuss and agree the content of the report, which represents the RT consensual views.

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

Šiauliai State College is the largest state-owned college in the region. The college is focused on regional needs and considers quality as its ultimate goal. It has two faculties: Faculty of Business and Technologies, and the Faculty of Health Care. The Information Systems Technologies study programme is conducted by the Informatics Engineering Department which belongs to the Faculty of Business and Technologies. The study programme came into existence in 2004 and was awarded a six-year accreditation in 2012.

1.4. The Review Team

The review team was completed according *Description of experts' recruitment*, approved by order No. V-41 of Acting Director of the Centre for Quality Assessment in Higher Education. The Review Visit to HEI was conducted by the team on 25/04/2017.

- 1. Prof. Liz Bacon (team leader)**, *Professor of Software Engineering, Deputy Pro Vice-Chancellor, Faculty of Architecture, Computing and Humanities, University of Greenwich, United Kingdom.*
- 2. Prof. Peeter Normak**, *Director of the School of Digital Technologies, Tallinn University, Estonia.*
- 3. Prof. Robert Pucher**, *Head of the Department of Computer Science, University of Applied Sciences "Technikum Wien", Austria.*
- 4. Ms Vilma Eidukynaitė**, *Director of UAB "IT Akademija", Lithuania.*
- 5. Mr Vytautas Mickevičius**, *doctoral student of Vytautas Magnus University, study programme Informatics.*

II. PROGRAMME ANALYSIS

2.1. Programme aims and learning outcomes

The design of the intended learning outcomes are sometimes articulated in terms of activities, not in terms of the competences of the graduates. Learning outcomes should be written following

from a sentence such as “A graduate of this bachelor programme will be able to” and verbs such as “understand” and “know” are hard to measure and should be avoided. An example is: “To plan, configure and administer groupware tools” (this would be better expressed as “Is able to plan, configure and administer groupware tools”). The meaning of some intended learning outcome may have suffered in translation. For example: 1) “To know main factors of business environment, project management and take responsibility for the results of engineering activities”. This apparently has the results of the *graduate’s* engineering activities in mind. Moreover, the learning outcome “To understand design methods of computer networks and choose the most optimal variant for a particular situation“ contains a questionable term “most optimal”. The learning outcomes should therefore be reviewed. Programme objectives and learning outcomes are publicly available both in Lithuanian and in English languages.

The study programme was developed after conducting a market analysis and has been revised taking into account market observations (including job advertisements). Based on that, a new specialization – Programming for Smart Devices – was introduced in 2015. Company representatives are involved in the study programme committee, as well as in teaching some of the subjects (modules). Both the graduates and employers agreed that the programme objectives and intended learning outcomes are linked to the state, societal and labour market needs.

The mission and vision of the college are formulated in general terms and do not specify any specific study area. Similarly, the strategy of the college (that was available in the Lithuanian language only) does not specify any study programme. The members of the administration / senior management team identified *regional*, *state* and *quality* as the keywords that identify the college. Therefore, it can be concluded that the programme objectives and intended learning outcomes correspond to the principles stated in the mission and strategy of the college.

The programme objectives and intended learning outcomes were formulated considering ACM recommendations for first level university degree in information systems, although this was not specified in the SER, which describes the conformity of the intended learning outcomes of the programme with the Description. However, this does not appear to take into account the descriptions of Outcomes for First Cycle Degree Programmes of Euro-Inf Framework Standards and Accreditation Criteria for Informatics Programmes (New Programme Outcomes of European Quality Assurance Network for Informatics Education EQANIE, as of 12.10.2015, http://www.eqanie.eu/media/Euro-Inf_New_Programme_Outcomes_for_Accreditation_2015-10-12.pdf) and these should be considered. Internet search reveals that these are most probably the learning outcomes taken from the “Descriptor of the Study Field of Engineering” approved by

Order No V-964 of the Minister of Education and Science of the Republic of Lithuania of 10 September 2015 (section 19, <http://www.skvc.lt/uploads/documents/files/EN%20versija/Quality%20Assurance/Study%20program%20descriptions/KVS.pdf>), although the formulations in SER are slightly modified in some cases. Moreover, the study programme covers only about half of the content of the core courses of “Curriculum Guidelines for Undergraduate Degree Programs in Information Systems” of ACM (<http://www.acm.org/education/curricula/IS%202010%20ACM%20final.pdf>): the topics of two courses out of seven (*Enterprise Architecture* and *IS Strategy, Management, and Acquisition*) are completely missing, and the topics of the remaining five courses are only partly covered.

The scope of the study programme is relatively broad and does not go deeply into any single topic. Although the learning outcome “To perform information search and analysis in order to apply latest technologies for the management of processes in the organization” is quite ambitious and could be considered appropriate to master level programmes. In general the programme objectives and intended learning outcomes correspond to the type and to the first cycle of studies and to the level of qualification.

The title “information systems technologies”, in a broad sense, could include the technical infrastructure for running information systems – although not very common but nevertheless used in some cases – it can be concluded that the content is appropriate for the title of the programme. On the other hand, the title of the programme assumes certainly a bigger share of courses in the development of information systems. Therefore, for example a more general name “Information Technology” would be equally suitable for the current study programme.

2.2. Curriculum design

The programme requires 180 credits of study and meets the legal requirements for both the full-time and part-time modes which are identical in content but just studied over a different time period. The minimum requirements for all of the subject content criteria are met, and in some cases exceeded. These areas are, subjects of the study field, which account for 138 credits (minimum requirement is 135), the professional placement which represents 30 credits (minimum is 24), the practice placements and other practical placement which account for 69 credits (minimum is one third which is 60) and, the final thesis which accounts for 12 credits (minimum is 9).

In general the curriculum reflects the learning outcomes of the programme and is broadly consistent with European degrees of a similar title and is taught in a consistent manner. The core subjects are considered appropriate for the title and cycle of the studies and the curriculum was well-received by social partners and students. The scope of the subjects was thought to be appropriate to achieve the learning outcomes.

In terms of the latest academic and technological achievements, the documentation provided identified a large number of dated text books in the recommended reading materials. This was in part due to the slow speed of translation into Lithuanian however, more online up-to-date resources are used and the reality should be reflected in the documentation. The latest software is used in teaching however again this was not reflected in the documentation and it should be updated accordingly. The Programme Management should also review the curriculum to ensure they are preparing students fully future developments in disruptive technologies such as cloud and big data. There is a good focus on the technical and practical skills within the study programme however these date quickly and it is important for students to also develop transferable skills such as team working, and ability to learn, which will equip them for a lifetime in the industry. It was also noted that project-based learning was limited and it was recommended that this aspect is enhanced.

In terms of updates to the curriculum since the previous review, whilst good examples of teaching the latest hardware and software were provided, these were not reflected in the documentation provided which identified fairly dated text books and software. The documentation should be updated to reflect the actual reading resources and software used. Some changes to the curriculum have been made in response to the recommendations from the last review, for example in upgrading the software used on the programme however, the team felt it particularly important that the programming focus was set in the context of the bigger picture of software engineering and this area should be strengthened to include addressing the full lifecycle, frameworks and methodologies etc.

The Programme Study Committee is recommended to consider the European curriculum guidelines from EQANIE as well as the ACM and should take a close look at the recommendations on the security content for non-security specialist informatics degrees which can be found at <http://www.eqanie.eu/media/cybersecurity-principles-learning-outcomes-whitepaper.pdf>.

The bachelor thesis demonstrated excellent practical skills and whilst these theses are for an applied bachelor degree, students should still demonstrate degree level attributes such as critical thinking, analysis and evaluation. These aspects were minimal at best and the literature referenced was predominantly technical documentation. As a result the thesis do not compare well with international standards and the team is strongly advised to encourage students to include that critical discussion in their theses, for example by providing information on implementation options considered and a rationale for their choice, what software design methodology they choose and why, an analysis of their approach to testing and some reflections in their conclusions regarding what they learned from the process etc. Embedding support from experienced researchers should help strengthen this area.

2.3. Teaching staff

The study programme is provided by staff meeting legal requirements, as 40% of study field subjects' volume is taught by scientists and 60% of the staff have 3 or more years of experience in their field of teaching.

The qualifications of the teaching staff are adequate to ensure learning outcomes. All teaching staff needs to hold a master's degree (or equivalent) in the field of teaching. There is a formal selection process for teachers. At least three years of practical experience is required for all teaching staff. Many teachers are working part time in companies to ensure their continuous qualification for teaching.

Teachers seem to have enough time to ensure the quality of teaching, 30% of their time is reserved for activities such as research and consulting. But especially in the case of junior teachers, 900 hours per year of contact time seems to be much and should be reduced. On average, one hour of contact time needs another hour for preparation of lessons, exams and organizing activities. If new lessons have to be prepared or if changes in the curriculum need to be undertaken, there is little capacity for that.

The number of teaching staff is adequate to ensure the intended learning outcomes. In the study year 2015 the staff:student ratio was approximately 1:18.4 students. Interviews with students indicate a short response time of teachers to questions and therefore it was concluded that the teaching staff were adequate to support the programme.

The college offers training and activities such as attending conferences or visiting other universities to ensure the quality of teaching. In the evaluated period 11 teachers participated in exchange programs in six different countries. Around two and a half weeks per teacher was spent in seminars on average. Teachers also went on internships into companies to ensure they remain familiar with industry practice.

The college organises an international week which started in 2015 to intensify contact with other universities which also helps teachers to improve their knowledge. Teachers are in close contact with companies, which ensures the contents of teaching are in line with the needs of companies. However, teachers also need to be involved more deeply in research activities to ensure they are familiar with scientific methods in their field of teaching. Teachers do participate in research activities, but only to a relatively small extent and there is room for improvement here. The turnover rate of teaching staff is small enough to ensure an adequate and stable provision for the programme.

2.4. Facilities and learning resources

The premises and equipment for studies are adequate, both in their size and quality. There are 12 rooms for theoretical and practical workshops, 7 specialized computer laboratories, and specialized physics, electronics and human safety laboratories. Distance Studies Classroom may be used in the study process. All classrooms are fully functional, have projectors for presentations and met the requirements for a suitable learning environment but not all classes are modern and educational inspired. The students complained that WIFI access is poor in some areas of the building.

Different types of licensed and modern software are used in computer laboratories for the developing practical skills of students. There has been signed a license agreement for MS products with Microsoft alliance (MSDN, DreamSpark) that allows students and teachers to use the latest software for teaching/learning purposes. The College is member of Autodesk Inc. Education Community but this fact is not mentioned in SER.

There are adequate arrangements for students' practice. The students choose the practice placement themselves or suggestions are made by a practice supervisor. The College has agreements with social partners and graduation practice is carried out in those companies.

The students don't use the text books in the library, they all use online materials. The Programme Team needs to update the documentation to reflect the reality of the reading materials they actually use and recommend to students, and they should have at least one copy for reference of recent text books which remains in the library for reference. This may have to be in English due to the slow speed of translation into Lithuanian, however this is not an issue given the strong English language skills of the students.

Students have access to books not only in the College library, but also in Šiauliai County Povilas Višinskis Public Library and Šiauliai University Library. The students have access to subscribed databases (EBSCO Publishing, Oxford University Press (OUP), Emerald Management eJournals Collection, Taylor & Francis), the ACM Digital Library and the IEEE Xplore Digital Library.

2.5. Study process and students' performance assessment

The entrance requirements for the study programme are appropriate and publicly available however students have different knowledge and skills on arrival so additional maths and physics classes are available should students need that additional support. The number of students admitted to the programme is relatively stable (34 in 2016) after a slight dip in 2015 to 27. It is good to see the average competitive scores for both part-time and full-time increased to 3.17 from 3.03 in 2014 and 2.69 in 2015. The information on the programme provided to students is consistent and clear and the graduates are clearly in demand not only locally but nationally and internationally. The social partners were also very enthusiastic about the programme and the graduates produced and would like more of them. It was noted that the number of students studying on the programme was relatively stable in both full-time and part-time modes of study.

There is good input into the teaching from industry and many of the full-time staff are engaged in applied research and consultancy with industry partners. This means they are able to support student contact, projects and placements with industry.

The College uses Moodle as their virtual learning environment and overall the study programme demonstrates a variety of assessments which support delivery of the learning outcomes. *Vivas* were also included regularly as part of the assessment in order to authenticate student work and this was commended. One area for improvement is to strengthen the development of team working skills and also to enhance project-based learning as these will be important not only at graduation but for the rest of a student's working life and this area is currently limited.

The culture of the college encourages students to engage with staff regularly for both academic and social support. This works very well and students were very positive about their experiences with regard to both of these commenting that staff are generally very quick to respond to student queries outside class contact time. Students also reported receiving feedback on their work, sometimes immediately but depending on the nature of the assessment, the maximum time to return marked work would be a week. The feedback from staff on their work was also reported to be helpful to their learning and they were also encouraged to ask staff for further explanations if they felt the needed it.

Students were very positive about the study programme commenting that the practical skills they learned were particularly important to them. Students considered the resources adequate to support their needs, the only minor issue being the speed of, or lack of, wifi in some areas.

Mobility options in the form of Erasmus+ exchanges are available to students and they are regularly advertised to them. Some students have taken up the option however many are restricted by personal circumstances such as commitments to employment which make it difficult to take a break for a semester or longer.

Some students were aware that a formal complaints and appeals procedure existed however no students who spoke to the review team had needed to use this as they felt very comfortable raising issues as and when they arose with staff, who they felt responded promptly to their issues.

2.6. Programme management

Responsibilities for decisions and monitoring of the implementation of the programme are clearly allocated and described in the SSC Statute and Quality Manual. The quality of the

programme is ensured by the Informatics Engineering Department. Meetings with teachers are organized every month (“department meetings”). The Information Systems Technology Study Programme Committee controls the implementation of the programme. This committee consists of the head of the Department, three teachers who are involved in the implementation of the programme, a student and an employer’s representative.

Information and data on the implementation of the Programme are regularly collected and analysed. Every year students are asked on their opinions and a survey of graduates is done. Twice a year (each semester) teachers express their opinion on the programme and teaching methods. The Dean’s Office of Business and Technologies Faculty annually collects information about the financial needs of the programme for teaching resources. The same is done by the library for library resources needed by the programme.

The outcomes of internal and external evaluations of the programme are used in a suitable way for the improvement of the programme. The review of the programme in 2012 was used to update the programme which resulted in changes described in detail in annex 6 of the SER. Also the opinion of graduates is taken into account when the programme is updated. This resulted in removal of learning outcomes graduates did not consider to be important in the programme. Based on the evaluations a new specialization for smart devices is being introduced.

Social stakeholders are included in the assessment processes of the Programme. Social stakeholders and students contribute to information used to improve the programme in various ways described in detail in the SER however there isn’t a formal process for gathering feedback and informing social partners of changes based on their input and this should be reviewed to ensure the input is fully considered by the team.

The internal quality assurance measures are effective and efficient. This is demonstrated in an impressive way by the positive opinion of interviewed companies on the skill level of graduates. The programme management is aware of lacking a tool for quick presentation of survey results and is looking for an improvement.

Whilst staff have some time to undertake applied research, publications from this work are limited and the leadership should look at how they can strengthen the research culture within the College which will enhance the quality of the educational experience for students.

III. RECOMMENDATIONS

1. The review panel is concerned about the small amount of courses devoted to the development of information systems in the study programme. To address this issue, the Committee of the study programme is recommended to *make the study programme more focused on different aspects of information systems*.
2. *The software engineering in the curriculum needs to be enhanced*. It lacks core software engineering, frameworks and methodologies, production environments etc. Note that this was supported by comments from social partners and alumni of the study programme as well.
3. Read the *EQANIE curriculum guidance in the design of the programme*, particularly those related to the recommended security content in ICT degrees and update curriculum as appropriate.
4. *The wording of the learning outcomes should be reviewed*. All learning outcomes should be worded to use an appropriate verb after a phrase such as “A graduate from this programme should be able to” avoiding the use hard to measure words such as “understand” and “know”.
5. *Project learning outcomes and implementation need enhancing*. Although this is an applied bachelor’s programme, students need to demonstrate bachelor level abilities of critical thinking, analysis, evaluation etc.
6. Enhance the development of *transferable skills* such as team working, project-based learning and the ability to learn how to learn and update the description of subjects according to these changes. For example, enhancing teamworking skills were contained in the learning outcomes in only three subject-specific courses.
7. Include more critical analysis, thinking and discussion in the *bachelor theses*. For example by providing a rationale, analysis and critical discussion of the decisions they took during the design and implementation of their software, and a reflection at the end on what they learned, what they might do different if approaching the problem again etc.
8. Introduce a formal process of *gathering feedback each year*, for example in a forum where social partners can brainstorm and hear each other’s’ thoughts, which is formally

documented and responded to, in order to ensure they are not e.g. reliant on a member of staff to pass on a comment to the relevant person for action.

9. *Articulate a research strategy* and an implementation plan, reviewing how to enhance the research culture, conduct seminars, deepen collaboration, bidding and publications etc.
10. The *quality of WiFi* should be improved as it was very poor in some areas.
11. The documentation should be updated to accurately reflect the library and IT resources used on the programme.

IV. SUMMARY

The *Information Systems Technology* study programme aims to prepare qualified specialists who are able to design, install and administer information and communication technology systems in an organization, maintain, improve and manage computer hardware and software, information systems, computer networks, etc. These competences are developed through 18 intended learning outcomes however the wording needs to be reviewed and implementation of higher level critical thinking / evaluation skills and transferable skills, need to be further developed in the students. In general these deliver the core competences of the programme however they are quite wide in scope, and the study programme could be more focused. It was also noted that the content of some important topics are limited.

The review panel was pleased to see the appearance of the efforts by the College in collecting the feedback from the students and social partners however the process for gathering input from social partners should be formalised to ensure input is not lost. Social partners would welcome more practical software development in teams, covering the full life-cycle of development of information systems and using programming languages and development tools and methodologies that are used in most professional software development companies.

The staff of the study programme are adequately qualified and they have close connections to the IT industry. This should be considered as a strength. The major concern, however, is related to the high teaching load of teaching staff, which certainly affects their ability to conduct research and development (R&D). This problem is also related to the financing of research which is very scarce as public R&D funding is targeted mainly to support fundamental research. A strategy to enhance the research culture going forward should be articulated

The premises and equipment for studies are adequate, both in their size and quality. However, the quality of WiFi should be improved as it was poor or absent in some areas. The programme seems to be managed according to the standards and established procedures of the College, and the internal quality assurance measures are effective and efficient.

The review team considers that forming a strong identity is a key factor for sustainability and future success of the study programme and to establish the most suitable niche in the academic landscape, determine a clear profile of the study programme, and review the study programme accordingly which may involve a change of title. .

V. GENERAL ASSESSMENT

The study programme *Information systems technologies* (state code – 653E15005) at Šiauliai State College 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	2
3.	Teaching staff	3
4.	Facilities and learning resources	3
5.	Study process and students' performance assessment	3
6.	Programme management	3
	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:	Prof. Liz Bacon
Grupės nariai: Team members:	Prof. Peeter Normak
	Prof. Robert Pucher
	Vilma Eidukynaitė
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