



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus technologijų ir dizaino kolegija  
**STUDIJŲ PROGRAMOS *TERMOINŽINERIJA* (valstybinis kodas –  
653E31002)**  
**VERTINIMO IŠVADOS**

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**EVALUATION REPORT**  
***OF THERMAL ENGINEERING* (state code – 653E31002)**  
**STUDY PROGRAMME**

At Vilnius College of Technologies and Design

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2. **Prof. Zbigniew Hanzelka,** *academic,*
3. **Prof. Frank Behrendt,** *academic,*
4. **Prof. Abdunaser I. Sayma,** *academic,*
5. **Dr. Ramūnas Gatautis,** *representative of social partners',*
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Išvados parengtos anglų kalba  
Report language – English

Vilnius  
2016

## DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Termoinžinerija</i>
Valstybinis kodas	653E31002
Studijų sritis	Technologijos mokslai
Studijų kryptis	Energijos inžinerija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (3 metai), iššęstinė (4 metai)
Studijų programos apimtis kreditais	180 ECTS
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Šiluminės energijos inžinerijos profesinis bakalauras
Studijų programos įregistravimo data	Lietuvos Respublikos švietimo ir mokslo ministro 2012 m. gegužės 18 d. įsakymu Nr. SR-2538.

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## INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Thermal Engineering</i>
State code	653E31002
Study area	Technological Sciences
Study field	Energy Engineering
Type of the study programme	University studies
Study cycle	First
Study mode (length in years)	Full-time studies (3 years), part-time studies (4 years)
Volume of the study programme in credits	180 ECTS
Degree and (or) professional qualifications awarded	Professional Bachelor of Thermal Engineering
Date of registration of the study programme	18 <sup>th</sup> May 2012, under the Order of the Minister of the Ministry for Education and Science of the Republic of Lithuania No. SR-2538.

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## **I. INTRODUCTION**

### ***1.1. Background of evaluation process***

The evaluation of on-going study programmes is based on the **Methodology for Evaluation of Higher Education Study Programmes**, approved by the Order No 1-01-162 of 20<sup>th</sup> December 2010 of the Director of the Centre for Quality Assessment in Higher Education (hereafter, SKVC). Evaluation is intended to help higher education institutions to constantly improve their study programmes and to inform the public about the quality of studies.

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

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

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

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

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

### ***1.2. General***

The application documentation submitted by the HEI follows the outline recommended by SKVC.

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

Vilnius College of Technologies and Design (hereinafter – the College or VCTD) was formed on 1<sup>st</sup> September 2008 by the merger of Vilnius College of Technologies with Vilnius College of Construction and Design. The name of Vilnius College of Construction and Design was changed into Vilnius College of Technologies and Design. The College is a public legal entity, acting as a

public institution. Whilst the College operates autonomously it remains accountable to the public through academic, administrative, economic and financial accounting activities, based on the principle of self-governance, academic freedom and respect of human rights. Studies at VCTD are oriented towards practical application of scientific knowledge and internship relationships to the professional and business world.

VCTD is divided into four faculties: Design, Civil Engineering, Petras Vileišis Railway Transport and Technical. 19 study programmes are offered, of which four study programmes of technological sciences are implemented in the Civil Engineering Faculty, four programmes of technological sciences and one programme of social sciences in Petras Vileišis Railway Transport Faculty, six programmes of technological sciences in the Technical Faculty and four programmes from the field of arts in the Design Faculty.

College faculties are subdivided into Departments. Planning of academic activities is decentralised in order to encourage the autonomy of faculties and departments and expedite the addressing of issues relating to academic activities, social partnership and other issues of the study process. The College fosters applied research, art and consulting activities. Additionally, qualification (self) improvement courses are organized and there are close ties with social partners. The College participates in *Erasmus* programmes.

The study programme, *Heat Energetics* was started in the College in the year 2002 within the Energy Engineering field of study. The curriculum was later modified in response to rapid changes in electrical engineering technologies and new demands of the labour market and in general to assist the students in acquiring a broader scope of competences. In order to reach harmonization between the title of the study programme, aims and intended learning outcomes, the updated study programme was renamed *Thermal Engineering*.

The *Thermal Engineering* study programme is the only first cycle Professional Bachelor programme within the Thermal Engineering branch of the Energy Engineering field in the general study area of Technological Sciences in Lithuania. The study programme *Thermal Engineering* has been hosted in the Civil Engineering Faculty since 2012.

#### ***1.4. The Review Panel***

The Review Panel was composed according to the *Description of the Review Team Member Recruitment*, approved by the Order No 1-01-151, 11/11/2011 of the Director of the Centre for

Quality Assessment in Higher Education. The visit to the HEI was conducted by the Review Panel on 3/12/2015.

**1. Dr. Thomas Flower (Chair of the Panel)**

*Dean of Faculty at the UAS Hamburg, Faculty for Engineering and Computer Sciences, Germany.*

**2. Prof. Zbigniew Hanzelka**

*Director of the Department of Power Electronics and Energy Control Systems at the AGH University of Science and Technology, Poland.*

**3. Prof. Frank Behrendt**

*Professor for Energy Process Engineering and Conversion Technologies for Renewable Energies at Berlin Institute of Technology (TU Berlin), Germany.*

**4. Prof. Abdunaser I. Sayma (not available for on-site visit)**

*Professor of Energy Engineering, and Associate Dean for Postgraduate Studies at the School of Mathematics, Computer Science and Engineering, City University London, United Kingdom.*

**5. Dr. Ramūnas Gatautis**

*Research Associate at Lithuanian Energy Institute, Lithuania.*

**6. Mr Giedrius Gecevičius**

*Doctorate Candidate (Energy and Power Engineering) at Lithuanian Energy Institute, Lithuania.*

## II. PROGRAMME ANALYSIS

### 2.1. Programme aims and learning outcomes

The aims of the programme *Thermal Engineering* are based on the engineering studies requirements and analysis of the nature of professional activities of trained specialists defined in co-operation with the members and professionals of Lithuanian Heat Suppliers Association. The study programme aims are to prepare competitive and highly qualified energy engineering specialists for the labour market, who can independently address professional issues by applying cutting-edge knowledge in the field of thermal energy engineering. Furthermore, the programme is designed to develop creative-minded, communicative specialists, able to work effectively in teams also empowered to make critical decision independently as the situations require, taking responsibility for personal results and continually seeking improvements in professional activities.

There are eight main intended learning outcomes presented in the Table 3 of the SER. Most of them are clearly defined, reflecting the main required skills of graduates. However, the *Thermal Engineering* study programme is closely related with the general society demand for a more sustainable energy system. One of the intended learning outcomes “Ability to evaluate engineering decisions in an ethical, social, economic and safety approach” emphasizes an important skill – namely to adopt a holistic approach when designing and operating heating systems. After the site visit to the College the Review Panel had the impression that students should be more critical, self-critical, innovative and creative. They do not seem to reflect much upon their future roles as engineers and areas of responsibility. The Panel challenge the staff to take this key intended learning outcome more seriously.

Intended learning outcomes and information about the programme are publicly accessible on the Internet: <http://www.vtdko.lt/studiju-programos-sf/termoinzinerija> (only in Lithuanian).

Intended learning outcomes are based on professional requirements, public needs and **current** specific demands of the labour market. This programme specializes on district heating systems in Lithuania, and the defined intended learning outcomes fully cover the requirements of the market. Moreover, the programme is consistent with the type and level of studies and the level of qualifications offered.

The Review Panel is concerned that the narrow focus on district heating technologies is too narrow looking into the future. Certainly, it is a fact that district heating is in the mid-term an

attractive market for the graduates, however, in the long term this may be a too limited market. The market demand is currently rapidly changing and thus other non-district heating technologies, such as autonomous heating systems, should also be covered in the programme. The Review Panel is of the opinion that the programme should open its scope to include autonomous heating systems, smart grids, electrical/thermal energy interaction, energy storage.

The *Thermal Engineering* study programme is unique to colleges in Lithuania and thus it cannot easily be compared to other programmes, but the name of the study programme and its intended learning outcomes seem to be competitive and attractive for students and the labour market.

Overall, the name of the programme, its intended learning outcomes, content and the qualifications offered are compatible with each other.

## **2.2. Curriculum design**

Legal requirements of the study programme *Thermal Engineering* at Vilnius College of Technologies and Design are met<sup>1</sup>. There are general college-level study subjects covering 15 ECTS (legal requirement – not less than 15 ECTS), study field subjects cover 135 ECTS (legal requirement – not less than 135 ECTS), special study subjects cover 30 ECTS (legal requirement is from 30 to 60 ECTS), total credits of the study programme are 180 ECTS (legal requirement is from 180 to 210 ECTS). These activities also include professional practices – 30 ECTS (legal requirement is for not less than 30 ECTS) and final project – 12 ECTS (legal requirement is for not less than 9 ECTS).

The first semester provides tuition to students in the fundamental sciences: Physics, Mathematics and Chemistry. Additionally, special subjects like Engineering Graphics are included. The second semester is oriented towards specific subjects like Hydromechanics, Applied Thermodynamics and so on. Besides this there is a possibility to choose one extra subject e.g. Environmental and Human Safety. The third and all the following semesters are oriented towards specialization (for example Cooling Technique or Renewable Energy Sources), also there is a possibility choose one extra subject (e.g. Law Basics). These subjects are mostly oriented and applied to district heating systems and are appropriate for the achievement of the intended learning outcomes.

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<sup>1</sup> General Requirements of the First Degree and Integrated Study Programmes, approved by the Order of the Minister for Education and Science of the Republic of Lithuania on 9 April 2010 No V-501.



However, some reviewed study subjects descriptions (Electricity Supply Base and Applied Thermodynamics) seem very full and challenging. Review Panel suggest to make sure that the scope of the study subjects can truly be achieved to a sufficient depth in the allocated time and revise subjects as required. Overall, the curriculum of the programme is sufficient to ensure the achievement of the intended learning outcomes.

The content of the programme reflects state-of-the-art technologies, especially the equipment in the Renewable Energy Resources laboratory is commended. However, only a very limited scientific research activity could be noted and the Review Panel suggest that the College develops a strategy in this area. Given current limited resources (financial, space and time) the College should not initiate broad research activities, but instead choose a very specific area of scientific research. The target would be to establish a satisfactory level of excellence, demonstrate the research potential of the College and give the students the opportunity to gain experience in this field. Despite few small details curriculum design of the study programme is on a good level.

### ***2.3. Teaching staff***

The teaching staff consists of 26 teachers (2014-2015 years). Six lecturers work in the College and additionally in other institutions. 24 of the 26 lecturers have more than 3 years' practical work experience. 12,5 % of the study subjects of the study field are taught by the lecturers with a degree in science (the requirement is at least 10 %). Teaching staff of the programme meet the legal requirements<sup>2</sup>.

Looking at the age of the staff members (in 2014-2015 there were 21,43 % of the lecturers who was up to 30 years; from 31 to 45 years – 28,57 %; from 46 to 60 years – 35,71 %; more than 60 years – 14,29 %) and the turnover in the last year, the Review Panel have no concerns as to the ability of the staff body to ensure intended learning outcomes going forward.

The main activity of teachers is students' education as research is only a minor (as it is the main goal of the College. The teaching staff qualification is adequate to ensure the achievement of the intended learning outcomes; even it would be a suggestion to encourage lecturers to pay more attention to scientific activity and as a result to get a doctor degree. A strength of the teaching

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<sup>2</sup> General Requirements of the First Degree and Integrated Study Programmes, approved by the Order of the Minister for Education and Science of the Republic of Lithuania on 9 April 2010 No V-501.

body is a deep level of practical experience thereby ensuring the demands of the programme. Unfortunately, English language skills of the teaching staff are very poor and conditions for those skills improvement should be worked on as a priority.

As it was already indicated, the teaching staff are not very much involved in research directly related to the study programme. There could be done more specific research, supported by international and local projects. Moreover, if the College truly wishes to develop an applied research profile, it needs to selectively invest in the infrastructure, personnel and offer its key potential researchers time to focus on applied research. The Review Panel could not find evidence of an existing applied research culture.

#### ***2.4. Facilities and learning resources***

The premises provided for the studies cover 17 auditoriums and 4 laboratories. All laboratories have no less than 20 working places and are well equipped to provide practical tuition to small groups of students. The equipment in the laboratories is sufficiently new and complies with new and state-of-the-art heating systems (e.g. equipment for conditioning, cooling, hydraulics). During the study process and practical work, students are able to work with various equipment and improve their practical skills very well, especially in heating systems. Students are able to design a special project and work with graphical programmes like *AutoCad*, *Tece-Balticum*, and software for selecting heat exchangers “*Danfoss*”. Thus, the premises for studies, teaching and learning equipment are adequate in both size and quality.

Learning material for specific study subjects is hosted on the e-learning platform Moodle. E-learning / distance learning is not very well developed as participation on the Moodle platform is low, but it appears that the College is striving for improvement and the Panel encourage this very much.

Teaching material (books) are provided in the library and on the evaluation the literature provided in the library was up-to-date. The following library databases are subscribed to: EBSCO Publishing, Oxford Reference Online, Tylor & Francis Online Library. Furthermore, the library subscribes to 99 popular science, analytical and current issues publications, e.g. “*Mokslas ir technikos raida*” (Development of Science and Technology). Overall, the teaching material is adequate for *Thermal Engineering* study programme.

Review Panel on the site visit noted that there was no access to EDUROAM at the College. As international exchange becomes more common this is a basic necessity and should be addressed.

## ***2.5. Study process and students' performance assessment***

The students admission requirements consist of assessment of the state final exam of mathematics (weighting factor – 0,4); the assessment of the state final exam of physics (weighting factor – 0,2); evaluation of foreign language skills (weighting factor – 0,2), assessment of the state final exam in Lithuanian language (weighting factor – 0,2), additional criteria like winning I-III place in “Olympics” or a comparable competition, achievements in sports, professional experience. Acceptance of students is coordinated by LAMA BPO (Association of Higher Education Institutions of Lithuania for Organizing the Common Admission).

Review Panel noted the very small number of students, in the period 2014-2015. Only 12 students were enrolled to studies which was stated as being sufficient to operate the programme as only a minimum of eight students is required. Nevertheless, the Review Panel have concerns on the low level of admission and believes that more attention should be paid to marketing the programme and making it more visible to potential students.

Contact and individual work hours are distributed in a similar fashion. In total there are 2332 academic contact hours (48,59 %). Individual studies of students make up 2468 of academic hours (51,41%). More explicitly, 884 hours are allocated to the theory lectures, 1007 hours to practical activities, 92 hours to preparation of course papers and 349 hours to personal consultancy. Students during the visit confirmed that lecturers actively ensure the possibility to consult via email and face to face in order to help students attain the high-level competencies. In the Review Panel's point of view, the organisation of the study process ensures an adequate provision of the programme and the achievement of the intended learning outcomes.

In the years 2012-2015 students and lecturers worked on the implementation of the following projects: Renovation of Student Dormitory – Modernization of Students Life, the proposal of covered courtyard project at Antakalnio St. 54 – CONNECTION, project Shopping and Leisure Centre. The projects are being implemented together in cooperation with IUT de Rennes bei Cnam Champagne-Ardene training institution from France. During the process of cooperation actual issues for energy sector are being discussed and implemented (e.g., in the study year 2013-2014 The Choice and Installation of Alternative Heat Source, in the study year 2014-2015 Installation of Centralised Heating Centre for Heating, Ventilation and Preparation of Hot Water). Students are thus encouraged to participate in applied research, but there still remains only a weak involvement of students and teachers in the scientific activity.

The College is making efforts to enable students exchange, however, only few students participated in international exchange, according to Erasmus+ programme (by going to Liberec University of Technology in the Czech Republic).

Academic support for the study programme is sufficient. First year students are given introductory lectures on the study programme: options for specialization selection, optional subjects, Faculty administration availability schedules, procedures of financial aid and provision of social support, information on mobility options. Moreover, the Head of the Library presents the resources of the library, possibilities to use databases, and the lecturers of the study subjects present goals of the subject and the intended learning outcomes, system and criteria of assessment, possibilities of consultations. Furthermore, they explain the chosen subjects, their importance for further studies and current activities. Besides this Faculty has provided the possibility to study by individual schedules, i.e. students can choose different subjects by the field of interest.

Students within the study programme have the possibility to obtain state supported loans and receive financial help to cover the cost of studies and living expenditures. Students, who achieve the best study results, receive motivation scholarships based on study results. 30 % of students, who were enrolled in 2012-2013 year of studies, in the first year received 1,5 Basic Social Benefit Motivation Scholarship, in the second year 30 % – 3 Basic Social Benefits and 30 % – 1,5 Basic Social Benefit, in the third year 25 % students got 1,5 Basic Social Benefit Motivation Scholarship.

In Review Panel's opinion, study process is quite well developed. The majority of graduates fully meet the labour market and stakeholders expectations. One of the biggest strengths of the programme is its career enabling content. Graduates are well-prepared for the (currently) important market of district heating. Employers that were interviewed were all satisfied with the performance of the College. It is very important to mention that the Review Panel received very positive feedback from the teaching staff and the students on their satisfaction with the work and study conditions.

## ***2.6. Programme management***

Responsibilities for decisions and monitoring of the implementation of the programme are clearly allocated, according to the College Statute, quality manuals, Integrated Development Strategy for 2011-2021, 2015-2017 years Strategic Plan, study regulations, statements of

commissions of study programmes, descriptions of the programme and study subjects, other internal and public documents regulating the studies.

There is a dedicated team (Committee of the Study Programme Thermal Engineering) to evaluate, improve and update the programme. They make proposals to the Dean's office concerning improvement of current study subjects of the programme or preparation of new study subjects, take part in assessment of theses and consider other questions related to the training of the specialists.

Students' opinion is evaluated by filling surveys which is done every study semester. Surveys also evaluate usefulness and applicability of every study subject. Lecturers can target improvement of the quality of teaching as they have access to the results of the student surveys. Attention to students' survey results is also considered during the attestation of lecturers.

The College has prepared and approved a plan to implement changes after the last external evaluation and based on the respective recommendations:

- The first recommendation was: "Review the variety and contents of optional courses and link them to profession of studies". In response the College prepared new optional study subjects and included them into the study programme: *Energy Consumption Efficiency, 3D Design of Building, Civil Engineering Architecture*.
- The second recommendation was: "Improve abilities of students to engage in applied research work using laboratory equipment". The College improved in this area by making use of laboratory equipment to carry out experimental research (e.g., "*Dependence of operation of air conditioning system on the temperature of the cooled air*", "*Determination of loss of pressure at obstacles in pipe works of various profiles*", "*Determination of parameters of a cooling system, diagrams of refrigeration cycle*"), the results of which were used in the preparation of term papers and theses (e.g., in designing renewable energy sources – installation of heat pumps).
- The third recommendation was: "Stronger integration of laboratory equipment into laboratory practical work of the study programme". To implement changes descriptions of laboratory apparatus and their operation were prepared in order to enable students to work with the laboratory equipment (e.g. descriptions of operation of laboratory equipment for the study subject *Hydromechanics* (2013), and the study subject *Cooling techniques* (2013), amongst others). The laboratory equipment is used to perform practical (laboratory) work within the study programme *Thermal Engineering* (e.g.

hydraulic stand is used to experimentally measure the pressure loss in pipelines and obstacles in the study subject *Hydromechanics*). In this case seminars are organised by staff and additionally students perform work in their individual projects.

- The fourth recommendation was: "Enhance and promote international mobility of students. Suggest courses taught in English to attract foreign exchange students". The College responded to this recommendation by preparing learning resources and initiating the subject "Renewable Energy Sources" in English for Erasmus students.

In general, the internal and external quality assurance measures are sufficiently effective and efficient. However, the College should pay extra attention to applied research activities in order to improve the qualification of the teaching staff and the quality of studies in the long term. Also attention should be paid to the English summaries of the final thesis which appeared not to be an usual practice in terms of this study programme.

### III. RECOMMENDATIONS

1. To develop more critical, self-critical, innovative, creative and responsible engineers with a wider approach to the heating market, looking more into the future society needs of Lithuania. This is, at the same time one of the key defined intended learning outcomes and targeted study results, but in the point of view of the Review Panel, these skills should be improved.
2. The designers of the programme need to keep a mid- to long-term focus on the potential energy market developments in Lithuania in order to prepare their graduates for dynamic changes in the labour market (e.g. automation, Industry 4.0, climate change, independence of fossil fuels, interaction of the heat/fuel/electricity markets, demand side management).
3. Some reviewed study subject descriptions (Electricity Supply Base and Applied Thermodynamics) seem very full and challenging. Review Panel recommends to make sure that scope of study subjects can truly be achieved to a sufficient depth in the allocated time and revise subjects as required.
4. In order to develop a much stronger international profile the College definitely needs to train its staff (administration and teachers) much better in English. Review Panel also recommend targeting fewer, but longer periods abroad for individuals versus more plentiful, but shorter stays.
5. The Review Panel recommends that the College should make stronger efforts to attract social partners from the relevant industry to lecture, at least part-time.
6. The programme could and should be marketed more (Internet, television, social media, schools) to boost applications.
7. Attention should be paid to the English summaries of the final thesis which appeared not to be an usual practice in terms of this study programme.

#### **IV. EXAMPLES OF EXCELLENCE**

The overall level of satisfaction expressed by all stakeholders that the Review Panel met during the site visit was exceptional. The Review Panel was impressed with the excellent organisation of the study programme and its enactors.



## V. SUMMARY

The study programme on *Thermal Engineering* provides an excellent environment for students. Curriculum design of this programme looks well adopted for the labour market. Students, graduates, teachers, employers are all satisfied with the performance of the College.

This study programme is very much focused on the building heating business, which is strongly dominated by district heating. This market focus is very narrow and Government regulated. Students graduating from this programme are potentially very suitable for this market, but vulnerable to major changes in the market, which the Review Panel believes are very much possible.

Facilities and learning resources are on the good level. Laboratories and library have a good standard for teaching, however, little to no potential for applied research could be found. Most of teaching staff have long-term practical work experience, but there are weak scientific activities and hardly any international scientific collaboration. Staff English language skills need to be improved.

The Review Panel also found that the College does not emphasize strong cooperation between business and scientific stakeholders (e.g. professors at universities). Study process and students' performance assessment and programme management are well developed. This study programme is very relevant to the labour market, but there remains a strong demand for the graduates of the programme, and the College could easily teach more students. In order to solve this problem the programme should be actively promoted to potential students.

## VI. GENERAL ASSESSMENT

The study programme *Thermal Engineering* (state code – 653E31002) at Vilnius College of Technologies and Design is given a positive evaluation.

*Study programme assessment in points by evaluation areas.*

No.	Evaluation Area	Evaluation of an area in points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	3
3.	Teaching staff	3
4.	Facilities and learning resources	3
5.	Study process and students' performance assessment	3
6.	Programme management	3
	<b>Total:</b>	<b>18</b>

\*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. Thomas Flower
Grupės nariai: Team members:	Prof. Zbigniew Hanzelka
	Prof. Frank Behrendt
	Prof. Abdunaser I. Sayma
	Dr. Ramūnas Gatautis
	Mr Giedrius Gecevičius

**VILNIAUS TECHNOLOGIJŲ IR DIZAINO KOLEGIJOS PIRMOSIOS PAKOPOS  
STUDIJŲ PROGRAMOS *TERMOINŽINERIJA* (VALSTYBINIS KODAS – 653E31002)  
2016-03-14 EKSPERTINIO VERTINIMO IŠVADŲ  
NR. SV4-77 IŠRAŠAS**

&lt;...&gt;

**VI. APIBENDRINAMASIS ĮVERTINIMAS**

Vilniaus technologijų ir dizaino kolegijos studijų programa *Termoinžinerija* (valstybinis kodas – 653E31002) vertinama **teigiamai**.

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

\* 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)

&lt;...&gt;

**V. SANTRAUKA**

Studijų programa *Termoinžinerija* suteikia puikią studijų aplinką. Programos sandara atitinka darbo rinkos poreikius. Studentai, absolventai, dėstytojai ir darbdaviai yra patenkinti kolegijos vykdoma veikla.

Studijų programoje daug dėmesio skiriama pastatų šildymo sektoriui, kuris yra dominuojamas centralizuoto šilumos tiekimo. Ši sritis yra labai siaura ir reguliuojama valstybės. Potencialiai studijų programos absolventai yra labai gerai pasirengę integruotis į darbo rinką, tačiau jei rinka pasikeistų, jie pajustų pasekmes, o tai, ekspertų grupės manymu, yra labai tikėtina.

Materialieji ištekliai, skirti programos vykdymui, yra geri. Laboratorijos ir biblioteka atitinka reikiamus standartus, tačiau jų esama būklė ir specifika beveik nesuteikia galimybių vykdyti

taikomuosius mokslinius tyrimus. Dauguma dėstytojų turi ilgalaikę praktinio darbo patirtį, tačiau beveik nevykdo mokslinės veiklos bei nebendradarbiauja tarptautiniu mastu su kolegomis. Akademinio personalo anglų kalbos įgūdžiai turėtų būti tobulinami.

Ekspertų grupė taip pat nustatė, kad kolegijoje nėra pakankamai pabrėžiamas bendradarbiavimas tarp verslo ir mokslo socialinių dalininkų (pvz., universiteto profesorių). Studijų procesas, studentų vertinimas ir programos vadyba yra plėtojami gerai. Ši studijų programa gerai atitinka darbo rinkos poreikius, tačiau vis dar išlieka didelė jos absolventų paklausa, todėl kolegijoje galėtų studijuoti ir daugiau studentų. Norint išspręsti šį klausimą, studijų programą reikėtų aktyviau reklamuoti potencialiems studentams.

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#### **IV. IŠSKIRTINĖS KOKYBĖS PAVYZDŽIAI**

Bendras visų socialinių dalininkų, su kuriais vizito metu susitiko ekspertų grupė, nusiteikimas studijų programos atžvilgiu yra itin pozityvus. Ekspertų grupei gerą įspūdį paliko puikus studijų programos vykdymo organizavimas.

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#### **III. REKOMENDACIJOS**

1. Ugdyti kritiškesnius (taip pat savikritiškesnius), inovatyviai mąstančius, kūrybiškus ir atsakingus inžinierius, kurie turėtų platesnę požiūrį į šildymo rinką, labiau atsižvelgtų į Lietuvos visuomenės ateities poreikius. Tai, beje, yra vienas iš pagrindinių programos numatomų studijų rezultatų ir siekiamybių, tačiau, ekspertų grupės manymu, šie įgūdžiai turėtų būti tobulinami.
2. Studijų programos rengėjai turėtų atsižvelgti į potencialią energetikos rinkos plėtrą Lietuvoje vidutiniu ir ilguoju laikotarpiu, kad parengtų absolventus dinamiškiems pokyčiams darbo rinkoje (pvz., automatika, Pramonė 4.0, klimato kaita, savarankiškas iškastinio kuro naudojimas, šilumos, kuro ir elektros rinkų sąveika, paklausos valdymas).
3. Kai kurie studijų dalykų aprašai (*Elektros tiekimo pagrindai* ir *Taikomoji termodinamika*) turinio atžvilgiu apima itin daug ir yra reikalaujantys daug studento pastangų. Ekspertų grupė rekomenduoja užtikrinti, kad per skirtą laiką tikrai įmanoma pasiekti tai, kas yra numatyta bei atitinkamai pakoreguoti studijų dalykus.

4. Siekiant tarptautinio kolegijos profilio plėtojimo, būtina tobulinti personalo (administracijos darbuotojų ir dėstytojų) anglų kalbą. Ekspertų grupė taip pat rekomenduoja orientuotis į ilgesnius personalo tarptautinius vizitus, vietoj didesnio kiekio, bet trumpesnių.
5. Ekspertų grupė kolegijai rekomenduoja dėti daugiau pastangų pritraukiant socialinius partnerius skaityti paskaitas (galimai ir ne visu etatu).
6. Studijų programa galėtų ir turėtų būti labiau reklamuojama (internetu, per televiziją, socialinius tinklus, mokyklose), kad pritrauktų daugiau stojančiųjų.
7. Derėtų atkreipti dėmesį į baigiamųjų darbų santraukas anglų kalba. Kaip paaaiškėjo vizito metu, jų pateikimas nėra įprasta praktika šioje studijų programoje.

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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)