STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

KLAIPĖDOS VALSTYBINĖS KOLEGIJOS
STUDIJŲ PROGRAMOS
MECHANIKOS INŽINERIJA (valstybinis kodas – 653H32001)
VERTINIMO IŠVADOS

EVALUATION REPORT
OF *MECHANICAL ENGINEERING (state code – 653H32001)*
STUDY PROGRAMME
At KLAIPEDA STATE COLLEGE

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DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	***Mechanikos inžinerija***
Valstybinis kodas	653H32001
Studijų sritis	Technologijos mokslai
Studijų kryptis	Mechanikos inžinerija
Studijų programos rūšis	Koleginės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	nuolatinės (3), ištęstinės (4)
Studijų programos apimtis kreditais	180
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Mechanikos inžinerijos profesinis bakalauras
Studijų programos įregistravimo data	2002 m. rugpjūčio 30 d., įsakymo Nr. 1515

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	***Mechanical Engineering***
State code	653H32001
Study area	Technology Sciences
Study field	Mechanical Engineering
Type of the study programme	College studies
Study cycle	First cycle
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 Mechanical Engineerring
Date of registration of the study programme	August 30, 2002, Order No. 1515

CONTENTS

I. INTRODUCTION

1.1. Background of the evaluation process

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

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

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

On the basis of external evaluation report of the study programme SKVC takes a decision to accredit the 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 SKVC. Along with the self-evaluation report and annexes, no additional documents have been provided by the HEI before, during and/or after the site-visit:

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

Higher education college study programme of *Mechanical Engineering* (hereinafter – ME) in the study field of Mechanical Engineering is implemented by the Klaipėda State College in the Faculty of Technologies. The ME study programme is supervised by the Department of Electrical and Mechanical Engineering (hereinafter – the "Department"). The Klaipėda State College structure allows pooling facilities and learning, financial and human resources which are necessary for the implementation of the study programme.

The ME study programme was previously evaluated by the Expert team in February 2009. The Expert team concluded that the ME study programme was to be given full accreditation. The study programme was revised in 2012 based on the learning outcomes, the ECTS concept and Dublin Descriptors[1] [2]; the learning outcomes were revised and the list of subjects updated in 2014.

This evaluation report is based on the Self-evaluation report submitted by Klaipeda State College and a visit to the university by the Expert team on 27th January 2015 during which relevant facilities were inspected and discussions were held with the following groups:

- University Administration
- Self-assessment group
- Teaching staff
- Students
- Alumni and social partners

1.4. The Review Team

The review team was assembled in accordance with the *Expert Selection Procedure*, approved by Order No 1-55 of 19 March 2007 of the Director of the Centre for Quality Assessment in Higher Education, as amended on 11 November 2011. The Review Visit to HEI was conducted by the team on 27th January, 2015.

[1] Dublin Descriptors, 2004. (http://www.jointquality.nl/content/descriptors/CompletesetDublinDescriptors.doc).
[2] Description of the study programme of Mechanical Engineering. Approved by Order No V19-3 of the Klaipėda State University of Applied Sciences Director of 29/02/2012.

1. Dr. Oluremi Ayotunde Olatunbosun (team leader), Senior Lecturer and Head of the Vehicle Dynamics Laboratory, School of Mechanical Engineering, University of Birmingham, United Kingdom.

2. Dr. Rynno Lohmus, Head of the commision of Estonian Higher Education Quality Agency; Senior Researcher at Faculty of Science and Technology, Institute of Physics, University of Tartu, Estonia.

3. Dr. Bojan Dolšak, Associate Professor and Head of Department for Construction and Design at Faculty of Mechanical Engineering, University of Maribor, Slovenia.

4. Dr. Andrius Vilkauskas, Dean of the Faculty of Mechanical Engineering and Design, Kaunas University of Technology, Lithuania.

5. Dr. Vigantas Kumšlytis, Manager of materials engineering and technical analysis at Public Company “Orlen Lietuva”, Lithuania.

6. Mr. Justinas Staugaitis, student representative from Kaunas University of Technology.

II. PROGRAMME ANALYSIS

2.1. Programme aims and learning outcomes

The stated aim of the study programme of *Mechanical Engineering* at the Klaipeda State College is to "train mechanical engineers who are capable of designing, modernising, operating and maintaining equipment independently, which requires personal responsibility as well as social, humanities, physical and technological knowledge, and who are capable of successfully adapting to the changing labour market" (SER, pp5).

The purpose, objective and learning outcomes of the study programme are related to the Klaipėda State College mission and are in line with the tasks established by the Klaipėda State College Integrated Development Strategy 2011–2021[3]: "improvement of the quality of studies, ensuring the compliance of the curriculum with the needs of the labour market, students' high quality professional practice, the development of innovative teaching/learning methods, high qualification of lecturers, modern academic facilities, the efficiency of students' consulting system, the development of the international scale of studies and other elements of the quality of studies".

The learning outcomes of the programme of study are described in detail and stated in clear, non-technical form which can be understood by the general public. They are well defined, clearly stating the knowledge, awareness, abilities and skills which the graduate will be expected to possess on completion of the Bachelors programme. They are based on the academic and professional competences required of a Bachelor of Engineering in the general area of mechanical engineering and they comply with the aim of the study programme. A table is presented (Self-evaluation report, Table 3) which shows a mapping of individual study subjects to study programme learning outcomes but this table is rather simplistic. A more detailed analysis is recommended which maps generic learning outcomes to individual subjects at the appropriate level.

The SER claims that the study programme was developed and improved based on the report of the study carried out by the Engineering Industries Association of Lithuania "Possibilities of Lithuanian Training Institutions to Ensure the Growth of Competitiveness in the Engineering Industry". The report points out that by 2025 the share of staff in the mechanical engineering sector with higher education will be 40–50%, compared to 20–30% in 2012[4]. The Lithuanian Labour Exchange has reported that mechanical engineers have more employment opportunities in Western Lithuania[5]. Also, the need for mechanical engineers in Western Lithuania has been demonstrated by placement results of Klaipėda State College graduates as well as a study on the relevance of competences provided for by Mechanical Engineering in today's Labour Market[6]

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[3] Integrated Development Strategy of the Klaipėda University of Applied Sciences 2011-2021 [accessed on 25/06/2014]. Internet access http://kvk.lt/images/stories/Informacija/Strateginiai_dokumentai/integruotos_pl%C4%97tros_strategija_2011-2021.pdf

[4] "Possibilities of Lithuanian Training Institutions to Ensure the Growth of Competitiveness in the Engineering Industry" [accessed on 19/03/2014]. Internet access http://www.linpra.lt/lt/apie-asociacija/naujienos/specialistu-rengimo-lietu-y5z5.html

[5] Employability Barometer of the Lithuanian Labour Exchange http://www.ldb.lt/Informacija/DarboRinka/Puslapiai/isidarbinimo_galimybiu_barometras.aspx [accessed on 02/06/2014].

[6] Study on the Relevance of Competences Provided for by Mechanical Engineering in Today's Labour Market, 2013.

carried out in 2013 by lecturers of the Klaipėda State College Department of Electrical and Mechanical Engineering. The study, which included a survey of respondents from different companies, found that mechanical engineering specialists employed at manufacturing, design, construction, computer, trading and other service companies positively view the learning outcomes of the study programme. Therefore the production of Bachelor graduates meets both public needs and the needs of the labour market.

The programme aims and learning outcomes are consistent with the level of knowledge, awareness and skills requirements of professional Bachelors' degrees in general engineering internationally. They conform to the requirement for the qualification of the trained specialists established according to Level 6 of the Lithuanian Qualifications Framework and of the European Qualifications Framework for Lifelong Learning; and are based on the provisions of Dublin descriptors which state that a graduate from the first cycle of studies has to 'demonstrate and be able to apply knowledge and understanding supported by advanced textbooks knowledge and knowledge at the forefront of the study field, to be able to collect and interpret data in the field of studies, which are necessary for finding solutions to important social and engineering problems, to substantiate suggested solutions, devising and sustaining arguments, to communicating information to audiences of specialists and non-specialists, to possess skills of autonomous learning that are of relevance to pursuing degrees in further cycles of studies'. However, as acknowledged in the SER (pp9), there is insufficient diversity in raising awareness about the study programme, so there is a planned improvement action to actively update the information provided in Lithuanian and English on the Klapeida State College website about the process, results and achievements of the ME study programme.

The name of the programme – *Mechanical Engineering* – is appropriate given the two specialisations of the study programme (Computerised Production Processes and Mechatronics). The degree is awarded in the field of Mechanical Engineering which is the most appropriate of the classifications approved by the Ministry of Education.

Strengths

- The objective and learning outcomes of the study programme are well defined in terms of the knowledge, awareness, abilities and skills which the graduate will be expected to possess on completion of the Bachelors programme. They are stated in clear, non-technical form which can be understood by the general public.
- Learning outcomes of the study programme are based on academic and professional requirements as well as public and labour market needs. Therefore graduates are likely to find employment. This was confirmed by the social partners (employers) during the evaluation visit.
- The objectives and learning outcomes of the study programme are in line with the type and cycle of study, and the level of qualification (Professional Bachelor). The learning outcomes are based on the Dublin descriptors thus ensuring an international outlook of the programme.

Weaknesses

- There is insufficient diversity in publicising of the process, results and achievements of the programme on the Klaipeda State College web site.
- While the study programme seeks to have an international outlook, it is still far from achieving it in terms of achieving sufficient mobility of lecturers and students.

2.2. Curriculum design

The design of the ME study programme meets requirements of the Description of General Requirements for Degree-Awarding First-Cycle and Integrated Study Programmes[7].

The total volume of the study programme is 180 ECTS credits or 4800 hours. The study programme consists of (see Self-evaluation report, Table 5) general university study subjects (15 ECTS credits – min 15), study subjects in the study field (141 ECTS credits – min 135), internships (30 ECTS credits – min 30), final thesis (12 ECTS credits – min 9). In addition specialisation subjects in the same field of study make up 15 ECTS credits while elective subjects make up 9 credits. Each academic year consists of 2 semesters with no more than 7 subjects delivered per semester. An attempt has been made to ensure a logical sequence in the delivery of the study subjects, consistent with the learning outcomes without undue repetition of material although some improvements could be made and it would be expected that some revision of prior material would be appropriate in linking previously taught material to new material. Assessment tasks in different subjects are also coordinated to reinforce the inter-disciplinary nature of the programme.

The content of the study subjects is at the level that would be expected for a Professional Bachelors programme. A combination of lectures, tutorials, seminars and practical work is used in delivering the modules. However, while the scope of most individual modules and the programme as a whole is sufficient to ensure the learning outcomes, sufficient time is not provided for the delivery of some subjects. English language is allocated only 3 ECTS credits and students mentioned that they find this insufficient. They would also like the study of the language to be more oriented towards scientific and technological vocabulary. Also, only 5 ECTS credits are allocated to 'Mechanics' which is a fundamental subject for this study programme. The subject 'Management' is taught in the second semester of year 1 in parallel with 'Economics'. It would be more appropriate to remove this and to introduce a new subject, 'Project Management' in the third year to include elements of business economics as a replacement for the subject 'Business Economics'. The subject 'Machine Elements and Mechanisms' should be focused on machine design with groups of students being set a major exercise to design appropriate machines using 3D CAD software such as Solid Works. Models of the machines may be prototyped in plastic using a 3D printer. This will ensure that the learning outcomes regarding team work is achieved. There is currently little evidence of team work apart from laboratory work.

The proportion of contact hours for individual study subjects varies between 53% and 56%, apart from the practical trainings and the final Bachelor thesis. This proportion is fine in the early part of the programme where strongly guided learning is important to ensure a sound basic scientific foundation. However the proportion of independent learning in individual subjects should increase in the latter stages of the programme, particularly in the final year to encourage students' self-reliance.

In order to keep up with the latest technological developments, the lecturers need to be engaged with the latest international research in their subjects. However most of the lecturers have not been involved in international mobility (only 8 out of 24 teachers were involved in international mobility programmes) or where they have been, the period has been very short, making it

[7] Description of General Requirements for Degree-Awarding First Cycle and Integrated Study Programmes, approved by Order No V-501 of the Minister of Education and Science of the Republic of Lithuania of 09/04/2010.

unlikely that they have had much opportunity to engage with the latest research and technology in the host institutions. Part of the reason for low participation in mobility programmes is the insufficient foreign language skills of many lecturers as evidenced by the requirement for a interpreter during the Expert team meeting with lecturers. Therefore it is not clear whether the content of the specialist technological subjects reflects the latest achievements in technology in these subjects. Comments by some of the students and alumni interviewed suggest that the contents of some of the subjects do not reflect the latest technological developments.

Strengths

- Study subjects are spread evenly over the programme and a logical sequence in their delivery consistent with learning outcomes is apparent.
- The learning outcomes of the study programme correspond to the type and cycle of study.

Weaknesses

- Too few credits are allocated to 'Mechanics' which is a fundamental subject for this study programme. It does not allow sufficient scope and time for students to acquire the fundamental knowledge of mechanics required for the design of machine elements and analysis of the dynamics of machinery. There is also a need to allocate more credits to English language and to orient the teaching more toward scientific and technological vocabulary.
- The proportion of contact hours in individual study subjects is quite high (53% to 56%) resulting in high teaching loads for lecturers. This proportion could be reduced for the later stages of the programme.
- The periods of international mobility of most lecturers is too limited to enable them to engage with the latest research and technology in host institutions. Hence the content of the specialist technological subjects may not reflect the latest achievements in technology in these subjects.

2.3. Teaching staff

The ME study programme is delivered by 24 lecturers, of which three are doctors of science and the remaining are lecturers with appropriate pedagogical and practical experience. Two lecturers are doctorate students in the technological and physical study fields. 14.8% of the study field subjects are delivered by lecturers having doctorate qualifications (minimum requirement – 10%). 23 out of the 24 lecturers are full time lecturers. This has addressed one of the recommendations of the last evaluation of the study programme in 2009.

Lecturers need to be engaged in science and research in order to keep up with the latest technology in their subject. However, it is noted that within the reporting period, while lecturers working in the ME study programme were engaged in applied research activities and published scientific articles, majority of the publications were in regional journals and local conferences. There is a need for the academic staff to engage more with the international community by attending international conferences and publishing in the top international journals in their field. The student-staff ratio is good at 17.21 students per lecturer's wage rate, which is in line with the requirements of Methodology for Evaluation of Actual Resources of a Higher Education

Institution (no more than 20 students)[8]. The age profile of the lecturers is good with a good number of younger staff (17% are under 30 and more than 37% under 45 – see Figure 1 in SER). Staff turnover is insignificant – mainly through retirement. Replacement lecturers were hired and it appears that succession planning is in place to replace retiring lecturers. The fact that selection of lecturers is on a competitive basis should ensure that the students are taught by the best available lecturers. However there needs to be an active culture of scientific research in the faculty with lecturers actively participating in conferences both in Lithuania and abroad. Therefore, as pointed out above, attendance at international scientific conferences and publication in top international journals should be encouraged. However, this requires that the lecturers develop their foreign language skills, especially English, to enable them participate in international conferences and mobility programmes as well as publish in international journals.

Lecturers seem to spend a high proportion of their time in pedagogical activity (average of 50%) as stated in the Self-evaluation report. This is because of the high proportion of contact with students. If the proportion of student self-study is increased, this will release more time for lecturers to engage in research activities (currently an average of 15%), increase the research output and improve the scientific content of the studies. Lecturers have the right and obligation to develop their professional competence through publishing methodological aids and study books, participating in different courses and training activities, internships and research and technological projects. Of particular benefit are the internships with various industrial companies which enable the lecturers to acquire hands-on experience of industrial processes and technology.

Lecturers also organise various seminars and training activities, and attract stakeholders to them. Opportunities are provided for courses of professional development, scientific discussions, scientific-practical seminars, academic readings and international scientific conferences. While these initiatives are good, it is to be noted that most of the international study visits are very short (a few days only). Longer visits (1 to 3 months or longer) will allow the participant time to absorb the latest technological developments and participate in the scientific activities in host institutions to the benefit of his/her own research on return to Lithuania. Furthermore, it would be appropriate for the proportion of time spent on pedagogical activities by all lecturers to be reduced to give them enough time to develop their professional and language skills and research. On a positive note, lecturers studying for their PhD are given sufficient time to carry out their research.

Strengths

- The age profile of lecturers is good and staff turnover is insignificant.
- Lecturers have the right and obligation to develop their professional competence through professional development courses, internships in industry, study visits, research and opportunities provided for human resources development implemented in the university.
- Two lecturers are doctorate students in the technological and physical study fields which should increase the science base of study programme.

[8] Methodology for Evaluation of Actual Resources of a Higher Education Institution. Order No V-1170 of the Minister of Education and Science of the Republic of Lithuania of 01/07/2011 [accessed on 02/06/2014]. Internet access http://www.litlex.lt/scripts/sarasas2.dll?Tekstas=1&Id=150724.

Weaknesses

- Lecturers spend a high proportion of their time in pedagogical activity leaving insufficient time for research.
- The foreign language skills of most lecturers are insufficient for them to participate in international mobility programmes or to deliver lectures in foreign language.
- There is insufficient international mobility of lecturers and most international study visits are very short and insufficient for lecturers to engage properly in the host institution to absorb the latest technological developments in their field.
- There is insufficient participation by lecturers of the study programme in international conferences and publication in top international journals.

2.4. Facilities and learning resources

It is stated in the Self-evaluation report that the classrooms and laboratories necessary for implementing the ME programme of study are adequate. There is on average 9 m^2 of the total area per student of the Faculty of Technologies. Classrooms and laboratories are shared with other study programmes in the Faculty of Technologies. However it was stated in the Self-evaluationreport that the financing of new equipment is inconsistent. Conversations with the administration revealed that improvements in facilities in the College in the last 3 years has been financed from funds totalling 14 million Litas (Institutional grants, projects and industrial contracts) of which 900,000 Litas was spent on *Mechanical Engineering* study programme. However, the annual budget for renovation and maintenance of laboratory equipment is only 10,000 Euros. Since the viability of the ME programme is a priority, new investment in facilities has been requested and it was felt that further funds will be provided. It is also hoped that cooperation with industry will provide further resources.

The ME study programme is implemented using modern computers and computer controlled equipment. The number of computers for students meets the needs of the study programme. All computers have standard text and graphic software packages installed as well as the Internet access. In the engineering design laboratory special software, such as AutoCAD and T-CAM, Automation Studio, are used while general purpose applications and programming software is provided on all computers in the computer classrooms. A list of facilities in the various laboratories is provided in Table 8 of the Self-evaluation report. While there have been substantial improvements in the facilities in the Mechatronics and Electronics and Microprocessor laboratories, the facilities in some of the other laboratories are outdated and need to be replaced e.g. in the metal cutting laboratory where machining centres using computer numerical control are required to allow the students to acquire experience of programming the types of machines employed in modern manufacturing industry. Data acquisition equipment for vibration measurement and analysis are also needed to improve the range of Mechanics skills that can be taught to students. More industry standard Computer-aided-Design software such as Solid Works also needs to be introduced to provide students with the 3D solid modelling skills required in industry today.

The internship activities are designed to ensure that students get adequate practical training in computer aided design as well as industrial experience with companies which have concluded agreements with the Klaipeda State College. Conversations with students, alumni and social partners confirmed that the internships are well organised and provide the right training for the students. It is also a good way for social partners to recruit graduates.

The Faculty of Technologies library resources are good with an adequate volume of titles and copies consisting of 38,933 physical units including subscription to 396 electronic journals. The library has 104 computer workstations with a wide variety of applications including engineering applications. Students of the Faculty of Technologies can also use libraries of other Klaipėda State College faculties (of Social Sciences and of Health Sciences), as well as library funds of the Klaipėda University (the cooperation agreement is renewed on an annual basis). *Mechanical Engineering* students may use subscription electronic books: VGTU e-book platform offers 106 units, and e-publication sets of Knygininkas UAB 199 units. In addition access is available to a good number of on-line electronic databases. Textbooks and other publications are sufficient and available in the electronic database accessible to students. Some monographs have been prepared by university Lecturers who teach on the study programme. These are available in the library as well as in the virtual learning environment Moodle, access to which is available to students at any time.

Syllabuses, methodological material for classes and seminars, individual works and terms papers for 32 courses of the ME study programme are available in the Moodle virtual environment at http://moodle.kvk.lt. Students may independently and at any time use methodological material prepared by Lecturers in the Moodle environment. The Moodle environment also contains electronic books (396 titles) which may be used by students not only in the Klaipėda State College, but also from home computers. Some lecturers use the Moodle environment, not just as a repository for their lecture materials, but also for self-assessment tasks. However, its full potential is not being exploited by most lecturers.

Strengths

- The study process is facilitated by modern laboratory and computer hardware/software in the Mechatronics laboratory and students are able to get hands-on experience through industrial internships.
- Adequate learning resources are available in the library.
- Virtual learning environment Moodle has been implemented although its full potential is not being exploited.
- EU Structural Funds has enabled renovation and modernisation of facilities.

Weaknesses

- Inconsistent financing for the upgrading of facilities and learning resources.
- Outdated facilities in the metal cutting laboratory need to be replaced.
- Further investment in laboratory facilities are also needed for ‘Mechanics’ teaching.
- Lack of industry standard 3D CAD software to provide students with the 3D solid modelling skills required in industry today.
- Lack of a 3D printer to enable students realise their designs in prototype form.

2.5. Study process and students‘ performance assessment

Student admission is on a competitive basis and carried out through the General Admissions of the Lithuanian Association of Higher Education Institutions (LAMA BPO). Competition is based on scores in secondary school examinations in 3 subjects related to the programme of study (Maths, Physics and Lithuanian) plus a foreign language multiplied by weighting coefficients. The students with the highest weighted scores are offered state financed places. Non-state financed places are available for those with lower scores. The number of students (full time and part time) admitted each year to the ME study programme has been fairly steady between 2011 and 2014 (between 53 and 61). Average score of candidates seems to have declined in recent

years. However the former students of the Klaipėda State College or other higher education institutions may also be admitted to year one, two, three or four of the ME study programme.

The study process is well organised and adequate provision is provided for the students to achieve the learning outcomes. An adaptation programme is implemented for freshmen to help them integrate into the higher education institution. Students are consulted on academic issues according to the schedule of consultations[9]. The schedule is announced publicly for the whole academic year. Lecturers consult students individually, by e-mail, via *Skype*, etc. The university has a virtual learning environment (Moodle) where lecturers publish their study material, tasks, other information necessary for learning. The Moodle environment may also be used for student consultations. It greatly facilitates students' academic activities in terms of time costs.

Students are supposed to be able to participate in student mobility programes. The Department of International Relations organises student and lecturer exchange on the basis of bipartite agreements (ERASMUS) and promotes participation in international projects (LEONARDO DA VINCI, GRUNDVIG, COMENIUS). At the beginning of every academic year, the staff of the Department of International Relations arranges meetings with students from the Faculty of Technologies. During these meetings, students are informed on mobility opportunities and requirements to be met in order to qualify for exchange programmes, and have their questions answered. The number of incoming students has been poor (only 3 in the last 4 years). This is probably due to few study courses being available in foreign language. More courses in English are being introduced. Participation in mobility programmes by students is very low (about 1 student per year on average). Conversation with the students revealed that they are reluctant to participate because they are uncertain that the subject they take abroad may not be exact match for the required subjects and they may not get credit for them. Another barrier is that they do not have sufficient language skills to be confident of undertaking studies in a foreign language.

Opportunities exist for students to participate in sports and artistic activities and social grants are available to encourage these activities. Likewise students are encouraged to participate in competitions and applied research activities as well as present their research results at scientific conferences. Students have participated in international Robotics competition in the last few years.

The assessment of courses are based on a 10 point scale approved by the Minister for Education. Bachelor is awarded based on the cumulative score over the programme. Students are made aware of the assessment tasks and the assessment criteria at the beginning of the course. However, students who met with the Expert team were not aware of the SER which suggests inadequate disemmination of information by the authorities. Regular testing is carried out through interim tests. The quality of final theses in the last 2 years has been very good with an average of 8. However the graduation rate over the last 2 years has been rather low varying between 47% and 64%.

Graduate placement has been good with between 71% and 86% finding employment within 4 months of graduation with between 53% and 69% in the field of study. This attests to the demand of the labour market. Surveys conducted to elicit the demand for Mechanical Engineering specialists and the satisfaction of employers with the skills of the graduates indicate

[9] Consultations schedule of the staff of the Department of Electrical and Mechanical Engineering, Faculty of Technologies, Klaipėda University of Applied Sciences. http://www.kvk.lt/index.php/lt/fakultetai/technologij-fakultetas/elektros-ir-mechanikos-katedra.

that there is a continuing demand for graduates of the programme and that employers are satisfied with the parctical abilities and communication skills of the graduates.

There have been instances of subjects taught in English by visiting lecturers from Turkey but few lectures are given in English by Klaipeda State College lecturers. Students were pleased to have the opportunity to receive lectures in English and expressed the wish to have more lectures given in English as much of the engineering vocabulary is in English language. This view was supported by alumni and some sicial partners.

Strengths

- Organisation of the study process ensures the proper implementation of the study programme and achievement of learning outcomes.
- Admission based on competition and best students get state financed places.
- Students are supported to participate in competitions and sports activities. Help available for socially disadvantaged students.
- Opportunities are available for participating in international mobility programmes.
- Most of the graduates find employment in their professional field.

Weaknesses

- Low take-up of mobility programmes.
- Declining average scores of admitted students.
- Low completion rates.
- Few subjects given in foreign language.

2.6. Programme management

The structure of the programme management and decision-making as well as the division of responsibility are defined in the College Statutes and do not overlap; a clear division of responsibility for the implementation and supervision of the programme is maintained. The Dean of the Faculty of Technologies is responsible for ensuring the quality of academic activities, coordinating studies of related study fields and applied research as well as planning activities of the faculty and submitting new or improved study programmes to the Academic Council for approval. The Dean's Office organises and controls the study process (approves lecture and examination schedules for the semester as well as schedules for retaking of examinations, documents governing the quality of studies of the faculty), organises reporting meetings for lecturers of study programmes and setting up certification commissions for facultylecturers. The Study Programme Committee drafts, improves and revises study programmes. The Committee, in close cooperation with stakeholders and the Department, formulates results of the programme, plans study subjects, establishes the intercommunication and links between the subjects, discusses, evaluates and certifies study subjects.

The quality of studies is an integral part of the Klaipėda State College quality management system which is based on requirements of ISO 9001, EFQM and other legislation governing the operation of the Klaipėda State College. The internal quality evaluation is carried out in a systematic manner and is based on the general principles of orientation to the student, unity, community agreement and cooperation and subsidiarity. Requirements of users (students, graduates and employers) are determined by including them into the formulation of criteria, and the satisfaction level is examined by surveys of different user groups. This is done by extensive opinion surveys of students, graduates and employers carried out annually. Additional information on the satisfaction of users is received from complaints, suggestions, direct

communication and media reports. Data received from observations, surveys, evaluations (self-evaluations, certifications of subjects and lecturers, notes and recommendations of the external evaluation of the study programme) and other information serve as a basis for discussions about improvement actions, the drafting and implementation of improvement plans.

Analysis of the survey data indicates that ME students are mostly satisfied with the organisation of the programme, course evaluation criteria and the virtual learning environment and felt that their opinions were taken into consideration in making improvements to the study programme. This was confirmed in the meeting with them. Graduates felt that the study programme provided them with sufficient knowledge which they were able to apply in the professional filed but they did not have enough practical skills. The surveys also revealed that social partners were mostly familiar with the purpose of the ME study programme and the internships. Again, this was confirmed in conversation with them. They believed that the number and duration of the internships were sufficient for their purpose and most would accept students of the study programme for internships in the future. However most social partners claimed that they could contribute more to support the study programme and would be prepared to support an Industrial Advisory Panel consisting of representatives of social partners and lecturers which could meet twice a year to exchange ideas about the study programme.

The lecturers of the study programme were also mostly satisfied with the processes involved in the monitoring of the quality of the study programme.

Strengths

- Structures for programme management are in place. They are detailed and well defined.
- Information collection and analysis as well as publication of the programme for the society and stakeholders are carried out in a systematic manner.
- All stakeholders (Lecturers, students, social stakeholders) are represented on programme evaluation panels and regular surveys of student and Lecturers are held.
- Opinion of social partners are sought on changes to the study programme. However, the social partners are prepared to be more involved. An Industrial Advisory Panel involving social partners and lecturers could provide a forum for such exchange of ideas.

Weaknesses

- There is inadequate involvement of enough stakeholders in management of the study programme and lack of events for communication of information about the programme.

III. RECOMMENDATIONS

1. The curriculum in its current form is not well balanced. ‘Mechanics’ which is a fundamental subject for this study programme is currently allocated 5 credits. This is inadequate to enable the students to be taught the fundamentals required for the study programme. It is recommended that credits for ‘Mechanics’ should be increased. The extra credits could be gained by removing the subject ‘Management’ from Year 1 as it is scheduled too early in the study programme. It would be more appropriate to introduce a new subject, ‘Project Management’ in the second or third year to include elements of business economics as a replacement for the subject ‘Business Economics’. The subject ‘Machine Elements and Mechanisms’ should be focused on machine design with groups of students being set a major exercise to design appropriate machines using 3D CAD software such as Solid Works. This will enable students to acquire experience of participating in a group project and gaining project management and communication skills.

2. Facilities in the area of metal processing should be renewed. Current ones are old and outdated and overdue for replacement. Modern machining centres using computer numerical control would allow the students to acquire experience of programming the types of machines employed in modern manufacturing industry.

3. Investment should be made in modern software for 3D modelling of machine elements e.g. Solid Works. A 3D printer is also recommended to enable realising the machine design projects through rapid prototyping.

4. Effort should be made to encourage international mobility of both lecturers and students. Improvement of the language skills of both lecturers and students is necessary to facilitate this, and enable lecturers to deliver more subjects in foreign language, thus increasing the choice of subjects for incoming exchange students.

5. More support should be given for student participation in international student competitions to strengthen team working skills including project management and communication skills.

6. Lecturers should endeavour to publish more in international conferences and journals.

7. Establishment of an Industrial Advisory Panel involving social partners and lecturers for such exchange of ideas about the study programme.

IV. EXAMPLES OF EXCELLENCE (GOOD PRACTICE)*

Provision of facilities for the disabled is excellent. There are two special reserved places for the disabled in the library. Disabled toilets and stair lifts are provided throughout the College.

V. SUMMARY

The stated aim of the study programme of *Mechanical Engineering* at the Klaipeda State College is to train mechanical engineers who are capable of designing, modernising, operating and maintaining equipment independently. Graduates are awarded the Professional Bachelor's degree in engineering after a study consisting of 180 ECTS credits. The previous study programme was evaluated by the Expert team in February 2009 which recommended that the ME study programme should be given full accreditation. The study programme was revised in 2012 based on the learning outcomes, the ECTS concept and Dublin Descriptors[10] [11]; the learning outcomes were revised and the list of subjects updated in 2014. Along with the revision of the study programme, around 900,000 Litas has been spent on improvements in facilities of the ME study programme in the last 3 years, financed from Institutional grants, including EU structural funds. This has resulted in substantial improvements in some of the laboratory and teaching facilities, particularly computer hardware/software and equipment in the Mechatronics laboratory.

However, the expert team found that further investment is still needed to replace outdated equipment in the metal cutting laboratory and to provide additional modern equipment for teaching Mechanics. Also, investment is required in industry standard solid modelling software (Solid Works) and a 3D printer. The old building in which the University operates is currently undergoing renovation which will provide substantial improvement in energy efficiency as well as an improved learning environment. Since the viability of the ME programme is a priority, new investment in facilities has been requested by the administration.

The expert team also found that some changes need to be made to the curriculum, specifically to increase the number of credits for 'Mechanics', which is a fundamental subject in the study programme. Furthermore, it is recommended that a new subject, 'Project Management' be introduced in the second or third year to include elements of business economics as a replacement for the subjects 'Management' and 'Business Economics'. The subject 'Machine Elements and Mechanisms' should be used as a vehicle for providing students with experience of executing group projects by designing appropriate machines using 3D CAD software such as Solid Works. Also, more credits should be allocated to English language and the teaching should be oriented more toward scientific and technological vocabulary.

The objective and learning outcomes of the study programme are well defined in terms of the knowledge, awareness, abilities and skills which the graduate will be expected to possess on

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[10] Dublin Descriptors, 2004. (http://www.jointquality.nl/content/descriptors/CompletesetDublinDescriptors.doc).

[11] Description of the study programme of Mechanical Engineering. Approved by Order No V19-3 of the Klaipėda State University of Applied Sciences Director of 29/02/2012.

** if there are any to be shared as good practice*

completion of the Bachelors programme. Only Klaipeda State College implements the higher education college study programme of *Mechanical Engineering* in Western Lithuania. Therefore this programme is vital for the provision of engineers needed for the industrial growth in Western Lithuania. The social partners confirmed the vital need for graduates of the study programme to the continued growth of their businesses and economic growth of the region and gave a positive assessment of the study programme.

The lecturers meet the required qualifications and are very enthusiastic. The students are also very enthusiastic about their studies and their lecturers. Organisation of the study process ensures the proper implementation of the study programme and achievement of learning outcomes and structures for programme management are in place. However international mobility of staff and students is low and improvement in this area is required which could be facilitated by better language skills of lecturers and students.

The expert team is of the opinion that the ME study programme at the Klaipeda State College is of vital importance to industrial development of the Western Lithuania region. It has many positive features and with further investment in facilities and the improvements recommended, could become an excellent study programme.

VI. GENERAL ASSESSMENT

The study programme *Mechanical Engineering* (state code – 653H32001) at Klaipeda 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	2
5.	Study process and students' performance assessment	3
6.	Programme management	3
	Total:	**16**

*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. Oluremi Ayotunde Olatunbosun
Grupės nariai: Team members:	Dr. Rynno Lohmus
	Dr. Bojan Dolšak
	Dr. Andrius Vilkauskas
	Dr. Vigantas Kumšlytis
	Mr. Justinas Staugaitis

Vertimas iš anglų kalbos

KLAIPĖDOS VALSTYBINĖS KOLEGIJOS PIMOSIOS PAKOPOS STUDIJŲ PROGRAMOS *MECHANIKOS INŽINERIJA* (VALSTYBINIS KODAS – 653H32001) 2015-03-16 EKSPERTINIO VERTINIMO IŠVADŲ NR. SV4-53-5 IŠRAŠAS

<...>

V. APIBENDRINAMASIS ĮVERTINIMAS

Klaipėdos valstybinės kolegijos studijų programa *Mechanikos inžinerija* (valstybinis kodas – 653H32001) vertinama **teigiamai**.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	3
2.	Programos sandara	2
3.	Personalas	3
4.	Materialieji ištekliai	2
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	3
	Iš viso:	**16**

* 1 - Nepatenkinamai (yra esminių trūkumų, kuriuos būtina pašalinti)
2 - Patenkinamai (tenkina minimalius reikalavimus, reikia tobulinti)
3 - Gerai (sistemiškai plėtojama sritis, turi savitų bruožų)
4 - Labai gerai (sritis yra išskirtinė)

<...>

IV. SANTRAUKA

Klaipėdos valstybinėje kolegijoje vykdomos studijų programos *Mechanikos inžinerija* (toliau - MI) nustatytas tikslas – rengti mechanikos inžinierius, gebančius projektuoti, modernizuoti, valdyti ir eksploatuoti įrenginius savarankiškai. Absolventams, baigusiems 180 ECTS kreditų studijas, suteikiamas inžinerijos profesinis bakalauras. Ankstesnę studijų programą 2009 m. vasarį įvertino ekspertų grupė, kuri rekomendavo *Mechanikos inžinerijos* studijų programą akredituoti be sąlygų. 2012 m. studijų programa buvo pakoreguota atsižvelgiant į studijų rezultatus, ECTS koncepciją ir Dublino aprašus[12] [13]; 2014 m. buvo apsvarstyti ir pakoreguoti studijų rezultatai ir atnaujintas dalykų sąrašas. Tikslinant studijų programą per pastaruosius 3 metus buvo išleista maždaug 900 000 litų MI studijų programos įrenginiams patobulinti, lėšos buvo skirtos iš institucijų dotacijų, tarp jų ir ES struktūrinių fondų. Tokiu būdu buvo iš esmės patobulintos kai kurios laboratorijos ir mokymo priemonės, ypač kompiuterinė įranga, programinė įranga ir Mechatronikos laboratorijos įranga.

[12] Dublino aprašai, 2004 (http://www.jointquality.nl/content/descriptors/CompletesetDublinDescriptors.doc).
[13] Studijų programos *Mechanikos inžinerija* aprašas. Patvirtintas Klaipėdos valstybinio universiteto Taikomųjų mokslų direktoriaus 2012-02-29 įsakymu Nr. V19-3.

Ekspertų grupė nustatė, kad vis dar reikia investicijų metalo pjovimo laboratorijoje pasenusiai įrangai pakeisti ir aprūpinti papildoma šiuolaikiška įranga, kuri būtina mechanikos dalykui dėstyti. Be to, investicijų reikia pramonės standartus atitinkančiai modeliavimo programinei įrangai (*Solid Works*) ir 3D spausdintuvui įsigyti. Senas pastatas, kuriame veikia universitetas, šiuo metu renovuojamas. Renovacija leis žymiai pagerinti energijos vartojimo efektyvumą ir mokymosi aplinką. Kadangi MI programos įgyvendinamumas yra prioritetinis, vadovybė prašė skirti naujų investicijų įrenginiams įsigyti.

Ekspertų grupė nustatė, kad reikia atlikti kai kuriuos studijų turinio pakeitimus, ypač padidinti „Mechanikai“ skiriamų kreditų skaičių, kuris yra pagrindinis studijų programos dalykas. Be to, rekomenduojama antrais arba trečiais metais įtraukti naują dalyką „Projektų valdymas“, kuris apimtų verslo ekonomikos elementus ir pakeistų dalykus „Vadyba“ ir „Verslo ekonomika“. Dalykas „Mašinų elementai ir mechanizmai“ turėtų būti priemonė studentams įgyti patirties vykdant grupinius projektus, projektuojant atitinkamus mechanizmus 3D CAD programine įranga, pavyzdžiui, *SolidWorks*. Daugiau kreditų reikėtų skirti anglų kalbai, dėstant plėsti mokslo ir technologijų žodyną.

Studijų programos tikslas ir studijų rezultatai yra gerai apibrėžti kalbant apie žinias, supratimą, gebėjimus ir įgūdžius, tikimasi, kad absolventai juos turės baigę bakalauro programą. Vakarų Lietuvoje tik Klaipėdos valstybinė kolegija vykdo aukštojo išsilavinimo koleginę studijų programą *Mechanikos inžinerija*. Todėl ši programa yra labai svarbi užtikrinant inžinierių pasiūlą, kurių reikia pramonės augimui Vakarų Lietuvoje. Socialiniai partneriai patvirtino šios studijų programos absolventų poreikį, siekiant užtikrinti tolesnį jų verslo ir ekonomikos augimą regione ir teigiamai įvertino studijų programą.

Dėstytojai atitinka būtinus kvalifikacijos reikalavimus ir yra pilni energijos. Studentai taip pat labai teigiamai atsiliepė apie savo studijas ir dėstytojus. Studijų eigos organizavimas užtikrina tinkamą studijų programos vykdymą ir studijų rezultatų pasiekimą, programos vadybos priemonės yra sukurtos. Tačiau darbuotojų ir studentų tarptautinis judumas yra mažas ir būtina šią sritį tobulinti, o tai galėtų padėti geresni dėstytojų ir studentų kalbos įgūdžiai.

Ekspertų grupė mano, kad Klaipėdos valstybinėje kolegijoje vykdoma MI studijų programa yra gyvybiškai svarbi pramonės plėtrai Vakarų Lietuvos regione užtikrinti. Ji turi daug teigiamų bruožų, o toliau investavus į įrenginius ir atlikus rekomenduojamus patobulinimus, gali tapti puikia studijų programa.

<…>

III. REKOMENDACIJOS

1. Ši studijų programa nėra gerai subalansuota. „Mechanikai“, kuri yra pagrindinis šios studijų programos dalykas, šiuo metu skiriami 5 kreditai. To nepakanka, kad studentai įgytų šiai studijų programai būtinus pagrindus. Rekomenduojama padidinti „Mechanikai“ skiriamų kreditų skaičių. Papildomus kreditus būtų galima skirti iš pirmųjų metų pašalinus dalyką „Vadyba“, nes jis studijų programoje yra suplanuotas per anksti. Tikslingiau būtų antrais arba trečiais metais įtraukti naują dalyką „Projektų valdymas“ ir įtraukti verslo ekonomikos elementus, kurie pakeistų dalyką „Verslo ekonomika“. Dalykas „Mašinų elementai ir mechanizmai“ turėtų būti sutelktas į mašinų dizainą, kuomet studentų grupėms būtų nustatyta pagrindinė užduotis – kurti atitinkamus mechanizmus, naudojant 3D CAD programinę įrangą, pavyzdžiui, *Solid Works*. Tai suteiktų studentams galimybę įgyti patirties dalyvaujant grupės projekte ir įgyti projekto valdymo ir bendravimo įgūdžių.

Studijų kokybės vertinimo centras

2. Reikėtų atnaujinti metalo apdirbimo įrenginius. Dabartiniai yra pasenę ir nusidėvėję, juos jau seniai reikėjo pakeisti. Šiuolaikiniai mechanikos centrai, kuriuose būtų naudojamas kompiuterizuotas staklių valdymas, leistų studentams įgyti šiuolaikinėje gamybos pramonėje naudojamų mašinų programavimo patirties.

3. Reikėtų skirti investicijų į šiuolaikinę mašinų elementų 3D modeliavimo programinę įrangą, pvz., konstrukcijų grafinį modeliavimą. Rekomenduojama įsigyti 3D spausdintuvą, kuris leistų realizuoti mašinų dizaino projektus greitaisiais prototipais.

4. Daugiau pastangų skirti dėstytojų ir studentų tarptautiniam judumui skatinti. Tam būtina gerinti dėstytojų ir studentų kalbos įgūdžius ir dėstytojams suteikti galimybę daugiau dalykų dėstyti užsienio kalba. Tai padidintų pagal mainų programas atvykstančių studentų dalykų pasirinkimą.

5. Daugiau paramos skirti studentams dalyvauti tarptautiniuose studentų konkursuose, kur jie gerintų komandinio darbo, taip pat projektų valdymo ir bendravimo įgūdžius.

6. Dėstytojai turėtų stengtis daugiau dalyvauti tarptautinėse konferencijose ir skelbti savo straipsnius leidiniuose.

7. Įsteigti patariamąją pramonės atstovų grupę, kurioje dalyvautų socialiniai partneriai ir dėstytojai bei galėtų keistis idėjomis apie studijų programą.

<…>

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)