



CENTER FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

EVALUATION REPORT
STUDY FIELD
MECHANICAL ENGINEERING
At Klaipeda University

Expert panel:

1. Prof. dr. Oluremi Ayotunde Olatunbosun (team leader) *academic*
2. Prof. dr. Jasmina Casals-Terré, *academic*
3. Prof. dr. Mikael Enelund, *academic*
4. Dr. Vaidas Liesionis, *representative of social partners'*
5. Mr. Marijus Ambrozas, *students' representative*

Evaluation coordinator – Ms. Evelina Keturakytė

Report language – English

© Centre for Quality Assessment in Higher Education

Vilnius
2021

Study Field Data*

Title of the study programme	<i>Mechanical Engineering</i>
State code	6121EX066
Type of studies	University studies
Cycle of studies	First
Mode of study and duration (in years)	Full-time (3.5 years) Part-time (5 years)
Credit volume	210
Qualification degree and (or) professional qualification	Bachelor's Degree in Engineering Sciences
Language of instruction	Lithuanian, English
Minimum education required	Secondary education
Registration date of the study programme	19-05-1997

** if there are **joint / two-fields / interdisciplinary** study programmes in the study field, please designate it in the foot-note*

CONTENTS

I. INTRODUCTION.....	4
1.1. BACKGROUND OF THE EVALUATION PROCESS.....	4
1.2. THE REVIEW TEAM	4
1.3. GENERAL INFORMATION	5
1.4. BACKGROUND OF STUDY FIELD/STUDY FIELD PLACE AND SIGNIFICANCE IN HEI	5
II. GENERAL ASSESSMENT	6
III. STUDY FIELD ANALYSIS.....	7
3.1. STUDY AIMS, OUTCOMES AND CONTENT	7
3.2. LINKS BETWEEN SCIENCE (ART) AND STUDY ACTIVITIES.....	10
3.3. STUDENT ADMISSION AND SUPPORT	12
3.4. STUDYING, STUDENT PERFORMANCE AND GRADUATE EMPLOYMENT	14
3.5. TEACHING STAFF	16
3.6. LEARNING FACILITIES AND RESOURCES	18
3.7. STUDY QUALITY MANAGEMENT AND PUBLICITY.....	19
IV. EXAMPLES OF EXCELLENCE	22
V. RECOMMENDATIONS*	23
VI. SUMMARY	24

I. INTRODUCTION

1.1. BACKGROUND OF THE EVALUATION PROCESS

The evaluation of study fields is based on the Methodology of External Evaluation of Study Fields approved by the Director of Centre for Quality Assessment in Higher Education (hereafter – SKVC) 31 December 2019 [Order No. V-149](#).

The evaluation is intended to help higher education institutions to constantly improve their study process 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 field SKVC takes a decision to accredit study field either for 7 years or for 3 years. If the field evaluation is negative such study field is not accredited.

The study field is **accredited for 7 years** if all evaluation areas are evaluated as “exceptional” (5 points), “very good” (4 points) or “good” (3 points).

The study field is **accredited for 3 years** if one of the evaluation areas was evaluated as “satisfactory” (2 points).

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

1.2. THE REVIEW TEAM

The review team was completed according the Experts Selection Procedure (hereinafter referred to as the Procedure) approved by the Director of Centre for Quality Assessment in Higher Education on 31 December 2019 [Order No. V-149](#). The Review Visit to HEI was conducted by the team on *November 24, 2020*. Due to the coronavirus pandemic, the Review Visit was organised online using video-conferencing tool (Zoom).

1. **Prof. dr. Oluremi Ayotunde Olatunbosun**, Honorary Senior Fellow in the Department of Mechanical Engineering at the University of Birmingham, UK.
2. **Prof. dr. Jasmina Casals-Terré**, Associate Professor (Accredited as FULL PROFESSOR by AQU), Department of Mechanical Engineering, Universitat Politècnica de Catalunya (UPCBarcelonaTech, Spain).
3. **Prof. dr. Mikael Enelund**, Dean of Education, School of MATS (Mechanical, Automation & Mechatronics, Design, Marine and Shipping), Chalmers Tekniska Högskola, Sweden.
4. **Dr. Vaidas Liesionis** LT AB Astra general Manager, Lithuania.
5. **Mr. Marijus Ambrozus**, graduate of Vilnius university second cycle study programme Theoretical physics and astrophysics, Lithuania.

1.3. GENERAL INFORMATION

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

No.	Name of the document
1.	Matrix of relations between study subjects and learning outcomes
2.	Descriptions of Study module programmes: Undergraduate Thesis, Process Engineering and Course Project, Technological Equipment, Physics 1, Practice

1.4. BACKGROUND OF STUDY FIELD/STUDY FIELD PLACE AND SIGNIFICANCE IN HEI

Klaipeda University (hereafter – KU, university) acquired the rights of the university by the Resolution (No. 1-640) of the Supreme Council of the Republic of Lithuania on January 1, 1991. Until now, KU remains the only structurally full-fledged, classical university in the region of Western Lithuania, a science and culture center with over 600 thousand population. KU is a multidisciplinary, national and Baltic regional leader in marine science and studies integrated into international academic networks, successfully realizing the goals defined in the University Statute, in line with the Bologna Declaration and the Lisbon Strategy.

The university implements all levels of studies. There are about 2,700 students who study in the full-time and part-time studies in 108 degree programmes in all three levels at the university. The University carries out over 60 international and national research projects each year, has scientific and academic partners in Europe and the rest of the world, and participates in several international foundations, programmes and networks.

Currently, KU has three faculties: Faculty of Social Sciences and Humanities, Faculty of Marine Technologies and Natural Sciences and Faculty of Health Sciences and two institutes: Institute of Baltic Region History and Archaeology and Institute of Archeology and Marine Research.

KU Faculty of Marine Technology and Natural Sciences has three departments: Engineering, Marine Engineering, Informatics and Statistics. The following undergraduate study programmes are carried out in the field of engineering sciences: *chemical engineering (environment and energy)*, *electrical engineering*, *maritime transport engineering*, *marine and port engineering*, *mechanical engineering*, *civil engineering and port structures*.

The Department of Engineering consists of the following subdivisions: about 20 research and training laboratories, specialized offices and training workshops. The Department of Engineering implements the following study programmes: the undergraduate study programme *Mechanical Engineering* in the field of mechanical engineering and the second cycle study programme *Production Engineering* in the field of production engineering. Other bachelor's study programmes are carried out in the fields of Electrical Engineering and Chemical Engineering.

The external evaluation of the undergraduate study programme *Mechanical Engineering* was performed by the Study Quality Assessment Center in 2009, and in 2015 accredited for a maximum 6-year period until 30/06/2021.

II. GENERAL ASSESSMENT

Mechanical Engineering study field and **first cycle** at Klaipeda University is given **positive** evaluation.

Study field and cycle assessment in points by evaluation areas.

No.	Evaluation Area	Evaluation of an area in points*
1.	Study aims, outcomes and content	3
2.	Links between science (art) and study activities	3
3.	Student admission and support	3
4.	Studying, student performance and graduate employment	4
5.	Teaching staff	3
6.	Learning facilities and resources	4
7.	Study quality management and publicity	3
	Total:	23

*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 evaluated very well in the national and international context, without any deficiencies;

5 (exceptional) - the field is exceptionally good in the national and international context/environment.

III. STUDY FIELD ANALYSIS

3.1. STUDY AIMS, OUTCOMES AND CONTENT

Study aims, outcomes and content shall be assessed in accordance with the following indicators:

3.1.1. Evaluation of the conformity of the aims and outcomes of the field and cycle study programmes to the needs of the society and/or the labour market (not applicable to HEIs operating in exile conditions).

(1) Factual situation

Klaipeda's economic breakthrough strategy until 2030 (Klaipeda 2030: economic development strategy and implementation action plan) envisions doubling the city's economy, creating 2000 new companies, 25,000 new jobs and implementing 100 projects attracting 1.5 billion Eur. foreign direct investment. In recent years, the need for mechanical engineering specialists in the western region of Lithuania has become especially evident due to the growing activities of Klaipeda port and the expanding industry and Free Economic Zone (FEZ) development. The goals of the first cycle *Mechanical Engineering* study programme (state code – 6121EX066) (hereafter – study programme) at Klaipeda University is to develop future specialists and creative personalities on the basis of advanced research; to develop scientific activities at the international level that promote scientific progress and cultural education of the society. This conforms with the manpower needs of the growing industrialisation of the Klaipeda County territory, especially the high-technology based industries involved in the Klaipeda Port and Free Economic Zone (FEZ). The aims and learning outcomes are defined in terms of both the academic content and professional requirements for Bachelors' level studies in Mechanical Engineering which conforms with the high-level manpower needs of the labour market in the country and specifically in the Klaipeda region.

(2) Expert judgement/indicator analysis

It is noted that there is currently a shortage of Mechanical Engineering specialists in Lithuania. The aims and learning outcomes of this programme should facilitate the training of Mechanical Engineers required to meet the manpower needs of the long-term strategy of Lithuanian economy until 2030 as well as the development plan of the Klaipeda region which requires highly trained professionals to man the expanding industry in this region. It can contribute to meeting the needs of the industry, especially in the Western Lithuania region.

3.1.2. Evaluation of the conformity of the field and cycle study programme aims and outcomes with the mission, objectives of activities and strategy of the HEI.

(1) Factual situation

The aims and outcomes of the field and cycle study programme are to train mechanical engineers who have the knowledge and skills to contribute to the sustainable development of the Klaipeda region and the country at large by meeting the growing needs of the industrial companies for mechanical engineering specialists. This conforms with the general goal of Klaipeda University to produce future specialists and creative personalities, with advanced research skills, able to develop scientific activities of international standard that promote scientific progress and cultural education of the society.

(2) Expert judgement/indicator analysis

There is a shortage of mechanical engineering specialists to meet the manpower needs of the industrial companies in Lithuania. Therefore, the mechanical engineering graduates from Klaipeda University are very much needed to fill the skills gap and contribute to the sustainable development of the Klaipeda region and the country at large. This conforms with the mission, objectives of activities and strategy of Klaipeda University.

3.1.3. Evaluation of the compliance of the field and cycle study programme with legal requirements.

(1) Factual situation

The programme scope is 210 credits while the scope of full-time study is 30 credits per semester. Credits to accomplish study results of the study field (including internship and preparation of a final thesis) amount to 192 credits (excluding electives). Preparation for final thesis and examination is 15 credits and internship is 15 credits. All of these comply with the legal requirements for the field and cycle of study. The contact hours for each course module are at least 37.5%. Over 90% of academic staff are scientists.

(2) Expert judgement/indicator analysis

The field and cycle study programme complies with all legal requirements.

3.1.4. Evaluation of compatibility of aims, learning outcomes, teaching/learning and assessment methods of the field and cycle study programmes.

(1) Factual situation

The aims and learning outcomes of the field and cycle study programme are expressed in terms of the knowledge, skills and abilities which the graduate of the programme should acquire. There is a good mix of teaching and learning methods that are used to deliver the courses which are appropriate for achieving the desired learning outcomes such as lectures, practice, laboratory work and projects (individual and group). Assessment is also based on a mixture of coursework, presentations and examinations which is appropriate. A matrix of the relations between study subjects and learning outcomes was provided in which some learning outcomes claimed for some subjects were inappropriate.

(2) Expert judgement/indicator analysis

The teaching/learning and assessment methods are compatible with the aims and learning outcomes of the field and cycle study programme. However, some of the learning outcomes inappropriately claimed for some subjects should be reviewed. The learning outcomes of some study subjects are not expressed in terms of the generic classifications (e.g. Final thesis, Practice, Human Safety, etc.). A revision of the learning outcomes is advised. Learning outcomes should be expressed in terms of what the graduate is able to do on completion of the study programme so expressions such as 'knows', 'understands', 'is aware of', etc. should be avoided.

3.1.5. Evaluation of the totality of the field and cycle study programme subjects/modules, which ensures consistent development of competences of students.

(1) Factual situation

The order of the study subjects is logical, starting with general university and engineering subjects in the first year, necessary for the student to develop basic knowledge and cognitive skills in mathematics, physical sciences and humanities. In the second, third and fourth years,

the subjects of mechanical engineering are taught in a logical sequence to enable the competences to be developed in a gradual manner, also providing the necessary knowledge and skills for the final thesis work. The learning outcomes of individual subjects generally map well into the study programme aims and objectives but there are some instances of inappropriate learning outcomes. Computer programming is not taught apart from specific applications like CNC coding and PLC programming. Computer programming scripting languages (e.g. Matlab, Python) are useful for writing applications to solve engineering problems and are a good preparation for developing specific applications such as PLC programming and CNC coding. Inclusion in the curriculum will enhance the students' capabilities. Basic thermodynamics is taught but applications such as thermodynamic cycles, power plants and air conditioning are not included in the curriculum. It appears that Hydrodynamics and Process Engineering are emphasised in the curriculum, possibly because of their importance to the local industries. Introduction of thermodynamic cycles into the curriculum will provide a more balanced curriculum.

(2) Expert judgement/indicator analysis

The totality and sequence of the study subjects, including the internship and final thesis, enable the student to develop the competences required of a graduate of the field and cycle study programme. However, it is recommended that a computer programming scripting language is introduced into the curriculum to increase the students' problem solving capabilities.. Also, it is recommended that the teaching of thermodynamics should be expanded to include applications such as thermodynamic cycles, power plants, air conditioning.

3.1.6. Evaluation of opportunities for students to personalise the structure of field study programmes according to their personal learning objectives and intended learning outcomes.

(1) Factual situation

Students have the opportunities to personalise the structure of their field of study programme by free choice of up to 42 credits (20% of total credits). This includes general university study subjects, final works, internship and electives. Students may also choose full-time or part-time studies to suit their particular circumstances. Mechanical engineering students under the guidance of docent of Department of Engineering have the opportunity to participate, annually, in the "International Aventics pneumobile competition" competition in Hungary, in which they have won many prizes.

(2) Expert judgement/indicator analysis

Ability for personalisation of their study programme by free choice of up to 20% of total credits is good. Participation in the International Aventics Pneumobile competition enables the students to develop team working and project management skills as well as develop international contacts.

3.1.7. Evaluation of compliance of final theses with the field and cycle requirements.

(1) Factual situation

The requirements for the final work are described in items 82-83 of the KU study regulations, in the description of general requirements for independent written works of Klaipeda University students (KU Senate Resolution No. 11-35 of 6 February 2020) and in the description of the subject „Undergraduate thesis“. The final thesis is assessed based on a ten-grade criterion scale. All members of the qualification commission participating in the thesis

public defence give two separate grades for the thesis and the defence. Final grade is the arithmetic average grade of all grades given by the commission members. The average grade is rounded down or up to an integer number.

The titles of the final theses indicate that they are within the specialisation of Mechanical Engineering study field. Most of the topics correspond with research and R&D projects being carried out by the lecturers and are relevant to the problems of local companies. However, it is not stated specifically that any thesis was commissioned by social partners of the HEI.

(2) Expert judgement/indicator analysis

The theses (except one which is available in English) are only available in the Lithuanian language so it is not possible to evaluate the contents. However, their relevance to solving problems of local companies is commendable.

Recommendations for this evaluation area:

- 1. Learning outcomes of all individual subjects should be revised and the table which maps the learning outcomes of individual subjects to the study programme learning outcomes should be updated. Learning outcomes should be expressed in terms of what the graduate is able to do on completion of the study programme so expressions such as 'knows', 'understands', 'is aware of', etc. should be avoided. The Study Programmes Committee should ensure that the study programme learning outcomes are harmonised with the individual study subject learning outcomes.*
- 2. It is recommended to introduce a computer programming scripting language into the curriculum.*
- 3. It is recommended that the teaching of thermodynamics should be expanded to include applications such as thermodynamic cycles, power plants, air conditioning.*

3.2. LINKS BETWEEN SCIENCE (ART) AND STUDY ACTIVITIES

Links between science (art) and study activities shall be assessed in accordance with the following indicators:

3.2.1. Evaluation of the sufficiency of the science (applied science, art) activities implemented by the HEI for the field of research (art) related to the field of study.

(1) Factual situation

Table 4 of the SER lists 7 scientific projects being executed by researchers and pedagogical staff in the field of Mechanical Engineering, all of which are focused on the sustainability of the industrial sector in the Baltic region. These include green technologies for Ports operation, electric ships, environmental protection, commercialisation of R&D results, etc. and most of them are multi-disciplinary. The strategic scientific direction of KU was approved in June 2020 and is "Towards Sustainable Technologies, Blue and Green Growth and Healthy Sea". The fields of mechanical engineering and materials engineering correspond to the priority direction "resource-saving technologies based on the principles of the circular economy". Also listed in Table 5 are 18 R&D projects executed by the Mechanical Engineering staff on behalf of industrial companies, mostly in the Baltic region, addressing various technical problems. These include application of new structural and composite materials, development of lighter structures and an innovative prototype of an electric bus. Researchers published more than 20 scientific papers (in Scopus database), more than 50 percent of which are in international scientific journals.

The Erasmus+ project "European University for the Sustainable Development of Smart Coastal Cities" started from 2019 September 1 and will run for a period of 3 years. This project will develop EU CONEXUS CAMPUS with joint bachelor, master and doctoral studies, joint research programmes, modern learning technologies, sports and cultural events. KU's share of the budget is €632,845, of which EC Grant is €506,276. In addition, the Horizon 2020 CONEXUS SWAFS project is dedicated to the qualitative transformation of EU CONEXUS research activities with a budget of 2 million Eur.; KU share is 0.5 million Eur., enabling joint research groups to be formed with the business and industry of the region.

(2) Expert judgement/indicator analysis

The listed research and industrial projects are an important contribution to the economy and industrial development of the region as well as enabling collaboration between academia and industry. The Horizon 2020 CONEXUS SWAFS project will further strengthen joint research activities with business and industry in the region. Publication of research in international scientific journals raises the international profile of the researchers and the university. There were over 20 publications by 16 members of staff over a period of 3 years. However, since the 16 members of staff have an FTE (Full Time Equivalent) of 11.75 (see Table 11 of SER), this is equivalent to over 1.7 publications per FTE. With the number of ongoing research projects this can be improved, so staff should be encouraged to increase their research output especially in international journals.

3.2.2. Evaluation of the link between the content of studies and the latest developments in science, art and technology.

(1) Factual situation

Study subjects in the study programme such as manufacturing technologies, process engineering, computer-aided design of processing technologies, computer analysis of structures, environmental engineering, etc. reflect recent trends in the field of Mechanical Engineering including advanced manufacturing technologies, 3D printing technologies, lightweight and composite materials, etc. Lecturers also expose students to their research work by creating opportunities for students to observe research experiments as part of the taught subject. The EU CONEXUS CAMPUS (see 3.2.1) will enable the development of joint bachelor, master and doctoral studies, joint research programmes, modern learning technologies, sports and cultural events.

(2) Expert judgement/indicator analysis

The contents of some of the taught subjects include recent developments in Mechanical Engineering science and technology. The EU CONEXUS CAMPUS is an opportunity to embed more of the latest science in the content of studies and create opportunities for joint research with international universities, business and industry.

3.2.3. Evaluation of conditions for students to get involved in scientific (applied science, art) activities consistent with their study cycle.

(1) Factual situation

Students have the opportunity to do their internship in the local industrial companies or in the research laboratories, e.g. in the Laboratory of Mechanics and Marine Engineering of the Marine Research Institute of Klaipeda University. Students also have the opportunity to be involved in research by choosing bachelor's thesis topics formulated as part of research projects and industrial R&D projects. This is evident in some of the student final theses.

Students have the opportunity to participate in the research and development of pneumobiles and compete in the annual International Aventics pneumobile competition.

(2) Expert judgement/indicator analysis

Good opportunities exist for students to be involved in scientific activities through internships in companies and laboratories, through participating in R&D projects with local industry for their bachelor's theses and in international pneumobile competition.

Recommendations for this evaluation area:

- 1. Increase the volume and quality of publications resulting from scientific research projects and R&D projects with local industry.*
- 2. Use the EU CONEXUS CAMPUS as a means for further collaboration with partners to develop research activities and science which is then embedded in the study programme.*

3.3. STUDENT ADMISSION AND SUPPORT

Student admission and support shall be evaluated according to the following indicators:

3.3.1. Evaluation of the suitability and publicity of student selection and admission criteria and process.

(1) Factual situation

Details of the programme and admission criteria are available on the university website [Klaipeda university \(www.ku.lt\)](http://www.ku.lt) and on the LAMA BPO website (www.lamabpo.lt). Admission is based on competitive score in the state maturity examination. The required competitive score has increased slightly since 2017 to 2020 and the number of signed study agreements has remained quite stable at between 8 and 10 in the last 4 years.

The programme aims and learning outcomes are well defined and clear. They are publicly accessible on the University web site in both Lithuanian and English. Detailed course descriptions are also available on the university web site in Lithuanian and English.

(2) Expert judgement/indicator analysis

Sufficient information on the details of the study programme and admission criteria for prospective students is available in Lithuanian and English on the university website.

3.3.2. Evaluation of the procedure of recognition of foreign qualifications, partial studies and prior non-formal and informal learning and its application.

(1) Factual situation

Evaluation of foreign qualifications is carried out by an employee of the Study Service in direct communication with the applicant taking into account the general (school (institution), programme, document status) or individual recommendations of SKVC. There is room for an applicant who does not agree with the University's decision on the academic recognition of a foreign qualification to appeal, within 14 calendar days of receiving the decision, to the Centre for Appeals for the Recognition of Education and Qualifications Related to Higher Education and Educational Programs of Foreign States and International Organizations (SER, Section 61). There is also an established process for the recognition of partial studies and prior non-formal and informal learning which conforms with standard practice in the EU countries. According to Table 9 of SER, 6 international students signed study agreements out of 77 applicants in 2018 to 2020. This is a large reduction from 14 international students (out of 98 applicants) who signed study contracts in 2017 alone. There was no report of any appeal.

(2) Expert judgement/indicator analysis

The procedure for recognition of foreign qualifications, partial studies and prior non-formal and informal learning is fair. The option for an appeal is good.

3.3.3. Evaluation of conditions for ensuring academic mobility of students.

(1) Factual situation

KU uses the ECTS for seamless transfer of study credits between institutions. There is a twice-yearly competition for students who wish to participate in the Erasmus+ mobility programme. The competition is widely publicised on the university website and social media to stimulate the interest of students. The choice of mobility destination is very wide as there are about 300 cooperation agreements in various fields. In 2017-2020, there were 19 incoming students (2018 - 4 students, 2019 - 9 students, 2020 - 6 students) to the study programme of mechanical engineering under the Erasmus + exchange program, and 4 outgoing students. The number of outgoing students is relatively small, but given the small number of students studying, it is about 15 percent. The students who were interviewed confirmed that opportunities to participate in international mobility is widely publicised but some students are unable to participate due to personal circumstances.

(2) Expert judgement/indicator analysis

Academic mobility of students is actively encouraged and transfer of credits for study abroad is straightforward by the adoption of ECTS. Still, the participation rate in mobility by KU students is low. The number of incoming students is quite encouraging but could still be improved upon. A survey of incoming exchange students should be carried out to find out why they found KU attractive to study. Although the website is functional in providing information for prospective students, its look and feel could be improved to help stimulate the interest of more international students in the university and the study programme.

3.3.4. Assessment of the suitability, adequacy and effectiveness of the academic, financial, social, psychological and personal support provided to the students of the field.

(1) Factual situation

Apart from state funding of some students, students at KU have the opportunity to receive an incentive, social, or one-time scholarship. Some scholarships are for academic performance while scholarships are also available for socially disadvantaged students and disabled students. Application for these scholarships can be made twice every year and they are advertised on the website of the State Studies Foundation. Further scholarships can be awarded each month if sufficient funds remain. One-time scholarships are also available for students' research activities, social activities and emergencies. Student counselling services are available to help students deal with academic and social and psychological problems. Free psychological counselling is available for students who ask for it.

(2) Expert judgement/indicator analysis

KU provides sufficient financial, academic, social and psychological support for its students.

3.3.5. Evaluation of the sufficiency of study information and student counselling.

(1) Factual situation

New students undergo a comprehensive induction programme during which they are introduced to the study programme and to the department staff to whom they can seek assistance on relevant issues. The head of the study programme introduces the study process,

organisation of student internship and participation in the Erasmus+ and other international student exchange programmes. During the first lecture the study subject teacher gives a comprehensive introduction to the organisation of the study subject – content, assignments, assessment methods and deadlines, etc. Career counselling is also available including help with writing CVs.

(2) Expert judgement/indicator analysis

KU provides sufficient study information and student counselling to its students.

Recommendations for this evaluation area:

- 1. More participation in exchange programmes should be encouraged.*
- 2. Conditions which encourage incoming exchange students should be further implemented.*
- 3. Improve the look and feel of the university website.*

3.4. STUDYING, STUDENT PERFORMANCE AND GRADUATE EMPLOYMENT

Studying, student performance and graduate employment shall be evaluated according to the following indicators:

3.4.1. Evaluation of the teaching and learning process that enables to take into account the needs of the students and enable them to achieve the intended learning outcomes.

(1) Factual situation

Information about the teaching methods and assessment methods are given in the description of each study subject. A variety of study methods are provided for, including individual study (course projects and final thesis) and team working (group projects, presentations and discussions). Students can choose the topics of their presentation and final theses as long as they fall within the content of the taught subject. Schedules of course work submissions and assessment details are also given to guide the students. Upon completion of the Bachelor's study programme in Mechanical Engineering and obtaining the Bachelor's degree in Engineering, there are opportunities for 2nd cycle studies in the field of technological sciences (SER, 36).

(2) Expert judgement/indicator analysis

Details of course subjects in terms of teaching and learning methods, assessment methods, given to students, enable them to plan their study. The mixture of individual work and team working enables the students to develop their individual abilities as well as group working skills which are crucial in the real working environment.

3.4.2. Evaluation of conditions ensuring access to study for socially vulnerable groups and students with special needs.

(1) Factual situation

All new university buildings are adapted for people with mobility and visual impairments. They are equipped with elevators and toilets for people with special mobility needs. Other buildings are being similarly adapted. In older buildings, persons with mobility impairments have access to the ground floors and wheelchairs are provided. The KU website has a special version for visually impaired people and Library departments provide readers with individual needs with access to special programmes in reading rooms. Special software, equipment, keyboards and braille printers are provided to enable visually impaired people to access information that they need.

(2) Expert judgement/indicator analysis

KU has made considerable effort to ensure that socially vulnerable groups and students with special needs have access to study at the university.

3.4.3. Evaluation of the systematic nature of the monitoring of student study progress and feedback to students to promote self-assessment and subsequent planning of study progress.

(1) Factual situation

Students are able to monitor their study progress using the Academic Information System (AIS) where evaluations of their independent work are made available. Students who were interviewed confirmed that the system works well.

(2) Expert judgement/indicator analysis

Students are able to monitor their study progress using the AIS and the students find this adequate.

3.4.4. Evaluation of the feedback provided to students in the course of the studies to promote self-assessment and subsequent planning of study progress.

(1) Factual situation

Students are provided with feedback on their assignments using the virtual learning environment (Moodle). Students are also able to receive informal feedback because of the small class sizes. Students who were interviewed were satisfied with the promptness and quality of feedback given on their work. In some cases, it is possible to re-submit their work to obtain a higher grade.

(2) Expert judgement/indicator analysis

The use of the virtual learning environment for feedback on students' submitted assignment works satisfactorily.

3.4.5. Evaluation of employability of graduates and graduate career tracking in the study field.

(1) Factual situation

Employability of graduates is evaluated using surveys of graduates. According to the latest survey 99% of graduates find employment soon after or even before graduating. About 95% are employed in positions related to their field of study, most working in industrial enterprises in the Klaipeda region. They are also holding important positions in their companies. The SER states that the opinions of graduates and employers are sought, through surveys, about their satisfaction with the competences acquired during studies. However, details of the analysis of the surveys are not presented. During interviews with the graduates and employers, they expressed that they were satisfied with the graduate's competences.

(2) Expert judgement/indicator analysis

The outcomes for graduates are excellent. Their employability is excellent and they are satisfying the need for mechanical engineering specialists in the Klaipeda region.

3.4.6. Evaluation of the implementation of policies to ensure academic integrity, tolerance and non-discrimination.

(1) Factual situation

“Code of Academic Ethics of Klaipeda University” (Resolution No. 11-2 of the KU Senate of 3 October 2019) defines the principles and means of ensuring academic integrity, tolerance and non-discrimination. It requires that assessment of a student's knowledge, abilities and skills must be fair, honest, impartial and consistent with the objectives of the course being taught. It requires that lecturers must avoid engaging in a non-academic commitment that can lead to conflicts of interest, and ambiguous relationships with students. Lecturers must also reduce the chances of students' academic dishonesty during the assessments and report any cases of student's dishonesty to the ethics committee. No case of violation of the principles of academic integrity, tolerance and non-discrimination was reported in the last 3 years.

(2) Expert judgement/indicator analysis

Policies to ensure academic integrity are well defined and the processes put in place for enforcing the codes of ethics are transparent.

3.4.7. Evaluation of the effectiveness of the application of procedures for the submission and examination of appeals and complaints regarding the study process within the field studies.

(1) Factual situation

Students have the right to appeal against assessment results and may apply to the KU Academic Ethics Committee for possible ethical violations. The appeals procedure is defined in section 172-178 of the study regulations of KU (<https://www.ku.lt/studies/wp-content/uploads/sites/20/2019/06/STUDY-REGULATIONS.pdf>). No appeals or complaints were reported in the last 3 years.

(2) Expert judgement/indicator analysis

KU properly provides for the submission of appeals and complaints regarding the study process and the process is well defined in the study regulations.

Recommendations for this evaluation area: none.

3.5. TEACHING STAFF

Study field teaching shall be evaluated in accordance with the following indicators:

3.5.1. Evaluation of the adequacy of the number, qualification and competence (scientific, didactic, professional) of teaching staff within a field study programme(s) at the HEI in order to achieve the learning outcomes.

(1) Factual situation

It is stated in SER (section 97), that 90% of lecturers who teach the main Mechanical Engineering subjects have a doctoral degree and carry out research. 16 lecturers are listed in Table 11 of which most are involved in research and R&D projects with industrial companies. They have a wide range of pedagogical experience (4 to 40 years). Their age distribution shows that a large proportion belong to the younger age groups but there are also older lecturers with lots experience to pass on to the younger ones. There is also a good balance between men (57%) and women (43%). No information is given in the SER about the level of the lecturers' proficiency in English language or other foreign language. However, some of the

lecturers have given lectures to students of foreign universities, mostly in English language, during exchange programmes. Also, international students interviewed during the evaluation visit confirmed that their lectures were delivered in English language and they were happy with their studies. The student to staff ratio is not stated in the SER but given the low number of students, a total of 11.75 full-time equivalent lecturers is adequate to deliver the study programme.

(2) Expert judgement/indicator analysis

There are sufficient number of well qualified and experienced lecturers who are also involved in scientific research to deliver the study programme. They are capable of ensuring the quality of the programme and achieve the learning outcomes. They easily meet the requirement for at least 50% of the lecturers of the field of study to be scientists.

3.5.2. Evaluation of conditions for ensuring teaching staff's academic mobility (not applicable to studies carried out by HEIs operating under the conditions of exile).

(1) Factual situation

Opportunities are available for academic staff to participate in international mobility programmes such as Erasmus+. About 30% of academic staff participated in pedagogical exchange programmes between 2017 and 2020. The SER does not give details of incoming academic staff in exchange programmes. Academic staff also have the opportunity for professional development through research trips to international universities, scientific institutes and industrial companies. Every year a list of academic staff expressing a wish to participate in research trips is prepared by the Faculty. The Communication and Study office presents foreign institutions where research trips for teachers are available.

(2) Expert judgement/indicator analysis

Opportunities exist for teaching staff to participate in academic mobility programmes. However, only 30% of the teaching staff participated in international mobility from 2017 to 2020. This should be improved upon in coming years.

3.5.3. Evaluation of the conditions to improve the competences of the teaching staff.

(1) Factual situation

Apart from research trips to international universities, scientific institutes and industrial companies, teaching staff can also attend professional development courses in Lithuania. Between 2015 and 2020 lecturers participated in over 50 of these courses.

(2) Expert judgement/indicator analysis

Sufficient opportunities are provided for teaching staff to attend professional development courses to improve their competences.

Recommendations for this evaluation area:

Participation in mobility programmes should be increased – the aim should be for every teacher to participate at least once every 3 to 4 years.

3.6. LEARNING FACILITIES AND RESOURCES

Study field learning facilities and resources should be evaluated according to the following criteria:

3.6.1. Evaluation of the suitability and adequacy of the physical, informational and financial resources of the field studies to ensure an effective learning process.

(1) Factual situation

The lecture theatres and rooms are adequately equipped for lecture delivery and with a variety of capacities to accommodate the number of students in each study subject. All new university buildings are adapted for people with mobility and visual impairments. They are equipped with elevators and toilets for people with special mobility needs. Other buildings are being similarly adapted. In older buildings, persons with mobility impairments have access to the ground floors and wheelchairs are provided. The laboratories are well equipped for the study of Mechanical Engineering subjects. The capacities of the laboratories are enough for the small numbers of students in the classes. The “Marine valley core creation and study infrastructure renewal” (SEA) provided substantial funds (€350k) for the renewal of infrastructure in 7 laboratories, and further amounts were spent on common engineering components. A total of €1.627m was also spent on the renovation of laboratories for the whole faculty in the project JURA including research equipment for the study of Mechanical Engineering. The videos of the facilities show the variety of laboratory equipment available for the study of Mechanical Engineering but it would have been better if the commentary on the facilities were in English instead of Lithuanian.

Students are also able to carry out practice in up to 28 companies using industrial standard equipment through cooperation agreements with these companies. The KU libraries are well stocked with textbooks as well as up to date journals. Access to electronic information resources is good with access to 45000 e-documents (e-books, e-journals, e-conference materials etc.). Also 50000 LST standards. The library also subscribes to scientific journals and bibliographic databases including Sage Journals Online, Sage IMechE Journals; ScienceDirect, SpringerLink, Taylor & Francis, Wiley Online Library, etc. However, it appears (Table 19 of SER) that the KU library fund replenishment from the KU budget has reduced from €70k in 2015 to €32k in 2020.

(2) Expert judgement/indicator analysis

The physical infrastructure available for the study of Mechanical Engineering consists of modern laboratory and research equipment, appropriate and adequate for the field of study.

The volume and quality of equipment including IT equipment and engineering software for CAD and CAE (including 3D printing) seems adequate for the needs of the students and this was confirmed by students who were interviewed. The opportunity for students to carry out practice in companies on industrial machines is excellent. Library facilities provide adequate resources for the students to access a wide variety of learning materials including e-books, e-journals, etc. A wide variety of scientific journals and bibliographic databases are available for research purposes.

3.6.2. Evaluation of the planning and upgrading of resources needed to carry out the field studies.

(1) Factual situation

The grants SEA and JURA obtained by KU for upgrading the laboratory facilities have been spent in providing modern laboratory and research equipment for the study of Mechanical Engineering. The library information resource fund is accumulated in close cooperation with university lecturers and researchers, taking into account the needs of the academic community and changes in study programmes. The total replenishment of the library fund with newly received documents is about 6100 copies per year (SER, Tables 17 and 18). The main sources of document collection are purchase, exchange, publications of KU publishing house and gifts from various persons and organizations. Projected budget for library fund replenishment in 2020 is €32k, a large reduction from €70k in 2015 (SER, Table 19).

(2) Expert judgement/indicator analysis

Grants obtained by KU seem to have been spent wisely to provide modern facilities to enhance the student's study experience and to develop competence.

It should be ensured that the budget allocation for library fund replenishment is maintained at a level that will ensure that students and staff continue to have access to adequate learning and research resources.

Recommendations for this evaluation area:

Adequate provision should be provided for in the KU budget for library fund replenishment to ensure that students and staff continue to have access to a wide variety of learning and research resources.

3.7. STUDY QUALITY MANAGEMENT AND PUBLICITY

Study quality management and publicity shall be evaluated according to the following indicators:

3.7.1. Evaluation of the effectiveness of the internal quality assurance system of the studies.

(1) Factual situation

The KU quality management system has received ISO 9001:2015 certification. A robust system has been implemented for the internal quality assurance in which responsibilities for the processes have been allocated. The study programme quality assurance is guaranteed by the Mechanical and Production Engineering Study Fields Committee (hereafter – SFC), while the Department of Engineering and Head of the Study Programme are directly responsible for the implementation of the study programme. SFC is an academic body supervising the study programmes of the study field and their implementation, and is accountable to the Faculty Council, which evaluates the quality of the study programmes of the faculty and considers and submits the study programmes to the Senate for approval. The process of administration and quality assurance of the study programme is reflected in the Academic Information System used by KU. Currently, KU is integrating a new Academic Information System, which will include changes in the implementation of studies at KU since 2014 and which will allow more automation in organizational processes, such as the provision of feedback, the calculation of pedagogical workload, etc.

(2) Expert judgement/indicator analysis

The quality assurance system is in place. However, there should be regular checks that it is achieving continuous improvement of the study process. For example, the management of the study subject learning outcomes needs to be improved (Section 3.1 of this report). It is necessary that the quality assurance system is audited periodically internally.

3.7.2. Evaluation of the effectiveness of the involvement of stakeholders (students and other stakeholders) in internal quality assurance.

(1) Factual situation

Students are involved in the evaluation of the content of study subjects and quality of teaching through questionnaires at the end of the semester. Surveys on study internships and reasons for termination of studies are also carried out as well as a survey of graduates. Social partners also participate in the evaluation and improvement of the study programme. Based on the data of the surveys the lecturers update the study programme which is then approved for future delivery. However, social partners revealed that they often do not receive feedback on changes made to the study programme.

(2) Expert judgement/indicator analysis

The system of involving all stakeholders in internal quality assurance is good. However, they do not often receive feedback on actions taken to update the study programme.

3.7.3. Evaluation of the collection, use and publication of information on studies, their evaluation and improvement processes and outcomes.

(1) Factual situation

Various methods are used for the collection of information on studies, e.g., questionnaires completed by students, surveys of graduates and employers, participation of employers in final thesis defence, etc. The collected data is then analysed to determine improvements which are needed. Teachers submit improved study programme for evaluation and approval by SFC.

(2) Expert judgement/indicator analysis

The system put in place is good. However, it is not clear where the information is published.

3.7.4. Evaluation of the opinion of the field students (collected in the ways and by the means chosen by the SKVC or the HEI) about the quality of the studies at the HEI.

(1) Factual situation

In accordance with the description of the KU study feedback organization procedure, at the end of each semester, in order to provide feedback, students are given the opportunity to evaluate the content of study subjects and the quality of their teaching by filling in the assessment questionnaire. Also, KU systematically conducts surveys on study internships, reasons for termination of studies and a survey of graduates. Thus, students' opinions about studies, their quality and acquired competencies are constantly analyzed. Only summary statistics of the survey results are published.

Students are represented in the Faculty Council, Senate and KU Council. They provide suggestions for improvements in the study programme quality in terms of study content to meet job market needs and teaching methods. In interviews with students during the evaluation visit, they expressed satisfaction with their studies and the help they receive from their teachers. They are also able to give their opinion to teachers informally.

(2) Expert judgement/indicator analysis

Students' feedback on the quality and organisation of their studies is collected using questionnaires and the information gathered is used in the continuous improvement of the study programme. Students' representation on decision making bodies is good practice. Informal feedback to teachers also results in quick remedial action being taken.

Recommendations for this evaluation area:

1. *The internal quality assurance system should be audited periodically.*
2. *All stakeholders should be notified of changes made to the study programme after each review.*
3. *Summary results of all surveys carried out should be published and made accessible to all stakeholders.*

IV. EXAMPLES OF EXCELLENCE

Mechanical Engineering students participate, annually, in the "International Aventics Pneumobile competition" competition in Hungary, in which they have won many prizes. This enables them to develop additional skills and competences as well as international connections.

V. RECOMMENDATIONS*

1. Learning outcomes of all individual subjects should be revised and the table which maps the learning outcomes of individual subjects to the Study Programme learning outcomes should be updated. Responsibility for harmonising the learning outcomes should be assigned to the Study Fields Committee.
2. A revision of the curriculum should be carried out with a view to including the following in the curriculum:
 - computer programming language (other than CNC coding and PLC programming which are application specific)
 - more thermodynamics, specifically thermodynamic cycles (thermodynamic cycles, power plants, etc.)
3. Use the EU CONEXUS CAMPUS as a means for further collaboration with partners to develop research activities and science in order to increase the volume and quality of publications.
4. Encourage more participation in international exchange programmes by both staff and students and implement conditions which encourage incoming exchange students. This should include improving the look and feel of the KU website.
5. Ensure that adequate provision is provided for in the KU budget for library fund replenishment so that students and staff continue to have access to a wide variety of learning and research resources.
6. The internal quality assurance system should be audited periodically to ensure that:
 - all stakeholders are notified of changes made to the study programme after each review.
 - summary results of all surveys carried out are published and made accessible to all stakeholders.

*If the study field is going to be given negative evaluation (non-accreditation) instead of RECOMMENDATIONS main **arguments for negative evaluation** (non-accreditation) must be provided together with a **list of “must do” actions** in order to assure that students admitted before study field’s non-accreditation will gain knowledge and skills at least on minimum level.

VI. SUMMARY

The following is a summary of the findings of the review team based on the Self-Evaluation Report and the interviews with the university administration (senior management and faculty administration staff), staff responsible for the preparation of the SER, teaching staff and stakeholders (students, alumni, employers, social partners).

The review team gives a positive evaluation to the implementation of the Mechanical Engineering study field and first cycle at Klaipeda University with all areas of evaluation assessed as good or very good.

The following are the key strengths of the Mechanical Engineering study field and first cycle as assessed by the review team:

- The study programme is crucial to meeting the manpower needs of the Klaipeda region which requires highly trained professionals to man the rapidly expanding industry in this region of Lithuania.
- The Staff, Alumni and Social Partners are highly committed and very supportive of the study programme, the university and its management.
- Lecturers are well qualified, and have both pedagogic and practical experience and motivation to successfully deliver the study programme.
- There has been a lot of improvement in the infrastructure of the university and the laboratories have been modernised in the last few years by judicious use of the SEA and JURA grants.
- The Erasmus+ project "European University for the Sustainable Development of Smart Coastal Cities" presents a great opportunity for collaboration with international and local partners to develop joint degree, research and science programmes through the EU CONEXUS CAMPUS.
- Students are very satisfied with the study programme and think their teachers are very helpful and act on their feedback.

The review team would like to highlight the following examples of good practice of the Mechanical Engineering study field and first cycle:

- Students participate, annually, in the "International Aventics Pneumobile competition" competition in Hungary, in which they have won many prizes. This enables students to develop additional skills and competences as well as international connections.

The review team would also like to highlight some areas for possible development of the Mechanical Engineering study field and first cycle, none of which are critical enough for lower grade of evaluation:

- Although study programme level outcomes expressed according to the recommendations of the EUR-ACE Framework Standards for the Accreditation of Engineering Programs, they are sometimes too generic, i.e., not specific enough. Also, sometimes several outcomes are mixed up in a single outcome. Learning outcomes should be expressed in terms of what the graduate is able to do on completion of the study programme so expressions such as 'knows', 'understands', 'is aware of', etc. should be avoided. Learning outcomes of all individual subjects should be revised and

the table which maps the learning outcomes of individual subjects to the Study Programme learning outcomes should be updated.

- A revision of the curriculum should be carried out with a view to including the following in the curriculum:
 - computer programming language (other than CNC coding and PLC programming which are application specific)
 - more thermodynamics, specifically thermodynamic cycles (thermodynamic cycles, power plants, etc.)
- Participation in international exchange programmes by both staff and students is still low. Continue to encourage participation and implement conditions which encourage incoming exchange students. This should include improving the look and feel of the KU website.
- The number of students is too small for the study programme to be sustainable on a long-term basis. There is a need to improve publicity for the study programme by engaging with schools – school visits, open days, social media, etc. as well as improving the website.
- A robust quality assurance has been implemented but the internal quality assurance system should be audited periodically to ensure that:
 - all stakeholders are notified of changes made to the study programme after each review.
 - summary results of all surveys carried out are published and made accessible to all stakeholders.

Expert panel signatures:

1. Prof. dr. Oluremi Ayotunde Olatunbosun (team leader) *academic*
2. Prof. dr. Jasmina Casals-Terré, *academic*
3. Prof. dr. Mikael Enelund, *academic*
4. Dr. Vaidas Liesionis, *representative of social partners'*
5. Mr. Marijus Ambrozas, *students' representative*