



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

**KLAIPĖDOS UNIVERSITETO  
GEOINFORMATIKOS STUDIJŲ PROGRAMOS  
(621F74001)  
VERTINIMO IŠVADOS**

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**EVALUATION REPORT  
OF *GEOINFORMATICS* (621F74001)  
STUDY PROGRAMME  
at KLAIPĖDA UNIVERSITY**

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## DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Geoinformatika</i>
Valstybinis kodas	621F74001
Studijų sritis	Fizinių mokslų studijų sritis
Studijų kryptis	Aplinkotyra
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Antroji
Studijų forma (trukmė metais)	Nuolatinė (2 m.),
Studijų programos apimtis kreditais	120 ECTS
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Geoinformatikos magistras
Studijų programos įregistravimo data	2011-09-01

## INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Geoinformatics</i>
State code	621F74001
Study area	Physical Sciences
Study field	Environmental Sciences
Kind of the study programme	University Studies
Study cycle	Second
Study mode (length in years)	Full-time (2 years)
Volume of the study programme in credits	120 ECTS
Degree and (or) professional qualifications awarded	Master in Geoinformatics
Date of registration of the study programme	2011-09-01

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## CONTENTS

CONTENTS .....	3
I. INTRODUCTION .....	4
II. PROGRAMME ANALYSIS .....	5
1. Programme aims and learning outcomes.....	5
2. Curriculum design.....	6
3. Staff .....	7
4. Facilities and learning resources .....	8
5. Study process and student assessment .....	10
6. Programme management .....	11
III. RECOMMENDATIONS .....	14
IV. SUMMARY .....	14
V. GENERAL ASSESSMENT .....	17

## I. INTRODUCTION

The objective of this report is to evaluate the Master study programme of “*Geoinformatics*” (national code – 621F74001). Programme is delivered by Klaipėda University (KU) in Klaipėda city. The study programme is run by Faculty of Natural Sciences and Mathematics.

The “Geoinformatics“ Master study programme was launched by Klaipeda University in 2011, so the programme evaluation was conducted by external reviewers at the first time. Due to only two years period of programme activities limited information was available about the post graduates and their evaluation by social partners.

Current assessment of “Geoinformatics” programme was carried based on self-initiative of the Minister for Education and Science of the Republic of Lithuania and was organised under the Minister’s authority by the Centre for Quality Assessment in Higher Education (hereinafter referred to as SKVC).

The expert team (also known as The reviewers team) consists of prof. dr. Bernd Teichert (group leader), prof. dr. Mercedes Farjas, prof. Janusz Uriasz, dr. Saulius Urbanas and Gražvydas Jakaitis. At the first instance the team analysed the Self-Evaluation Report (hereinafter referred to as SER) provided by Klaipeda University. The visit in the university at 20<sup>th</sup> November involved meetings with the following groups:

1. The faculty Administrative staff;
2. The staff responsible for preparation of SER;
3. The Teaching staff;
4. The Students;
5. The graduates;
6. The Employers and Social partners.

## II. PROGRAMME ANALYSIS

### *1. Programme aims and learning outcomes*

According to the SER the main aim of the programme is to prepare higher qualification Geoinformatics specialists (graduates) with an emphasis on marine and coastal research and development area that meet the requirements of the modern knowledge-based economy and existing high professional standards in the field (GIS&T BoK, GIS science and Geospatial Science Competency Model, ACM curricula: CSC2008 and IS2010) and to ensure the following main qualities of the curriculum:

- P1 to reflect current and future labour market needs,
- P2 to support both traditional and emerging career opportunities,
- P3 to ensure graduates to be prepared for positions in all European area,
- P4 to remove employers' uncertainty by providing all degree holders with advanced core set of knowledge,
- P5 to ensure that graduates possess critical awareness of knowledge issues in even growing geoinformatics field and at the interface between different fields to be prepared to manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches and solutions based on emerging technologies,
- P6 to ensure that graduates will leave university with enough capacity and the motivation to continue their further studies and/or their learning throughout life,
- P7 to allow international student mobility.

Following SER (page 4) and responses of the administrative staff during the visit, the master study programme was developed within the framework of the new innovative Maritime Valley Programme. The major documentation of the study programme was produced and further updated implementing the project Improvement of the II Cycle Studies of the Marine Sector JŪREIVIS (Sailor) executed by the Agency of the European Social Fund and Klaipėda University.

The programme satisfies the requirements of the Decree of the Lithuanian Science Council and the Government (No V-501, 2010-04-09). The programme aims are clear, well defined and publicly available through the University website, the Faculty website, Facebook of University and the Faculty and by the specific web based Academic Information System (further – AIS) and printed materials. Also the study programme was communicated and discussed with public and private authorities of the Klaipėda region, taking part in the activities related the use of Geographic Information Systems (further - GIS).

The learning outcomes and qualification criteria are also well defined and are available to public via the University website and publications. During the visit the administrative staff confirmed that the learning outcomes and evaluation criteria were communicated in oral by teachers at the beginning of lessons in each semester. It was acknowledged by students that the Dean, teachers and administrative staff were in close relations with them in introduction and discussion of the programme aims, learning outcomes and evaluation criteria.

The subjects and inter-relation amongst the subjects (SER, page 11) are logic. The study programme has good inter-disciplinary connection to other university's programmes, especially related to Information Systems, Informatics Engineering, Sea Monitoring, Remote Sensing from Oceanographic studies. During the visit Dean informed about the initiatives of building the platform of knowledge exchange between other Universities of similar programmes in Lithuania.

The reviewers paid attention to minor duplications of terms in the descriptions of learning outcomes (pages 9-10 in SER), which in some instance was affected due to translation to English. Those mainly relate to the description of Research abilities B1, Specific skills C1 and C2. However this does not affect the positive evaluation of the learning outcomes.

The initial analysis of SER posed a possible lack of content provided in relation to the development of Spatial Data Infrastructures (National, European, Global). However the meeting with staff and the group of SER producers provided proofs of SDI content in the related subjects as “Modern GIS”, “Integrated Data Management” and “Geodata repository”.

Besides further scientific research it is an expectation that the graduates will satisfy the knowledge and experience for working as geoinformatics experts and GIS specialists in Lithuanian and European environment protection departments, geoinformation services, municipalities, real estate agencies, landscape and water management institutions, harbours and GIS software and services development companies. The meeting with graduated students and social partners proofed the usefulness of the learning outcomes versus to demands not only environmental and marine, but also from non-environmental areas, like management of large scale utilities, other municipal GIS services.

The programme is new, it was implemented only two years ago (SER, page 12), so gross improvements are not rather expected. However during the visit, proof was provided about the regular discussions of programme improvements and suggestions for changes. Following the involvement of new post-doctoral staff members improvements were made in bringing more practical exercises, remote and e-learning capacities, sharing the findings in research projects. Students were asked to complete questionnaires for reflecting a level of usefulness of the programme. Due to the small group of students (only 6 based on SER, page 26 and the findings during the visit) the bilateral discussions with the Dean was used as a common practice for monitoring the programme.

The reviewers considered a wide scope of subjects in study programme and the methodology obtaining skills and knowledge well meet the demands of potential employers. Good connection with the research in marine applications, acquiring of modern technologies (software, hardware) and high quality of graduates’ skills were acknowledged as strong sides by social partners and the reviewers accordingly. In order to improve the programme and considering the feedback from the meeting with students and graduates reviewers would recommend for extending the programme involving more professional practice.

## ***2. Curriculum design***

There is the comprehensive list of the legal acts and reference documents listed in SER, section 2.2.1.1. Reviewers confirm the curriculum design satisfies legal requirements and meet requirements for the University undergraduate study programmes.

The structure of curriculum:

- The number of 120 study credits satisfies the requirement (from 90-120). The study volume is distributed along 4 semesters of 30 credits each.
- The programme consists of
  - Mandatory subjects – 54 credits (45 %);
  - Elective subjects at the choice by students from 4 options per semester – 18 credits (15%) satisfies the requirement of no more than 30 credits;
  - Research work – 18 credits (15%) satisfies the requirements;
  - Final Master Thesis preparation – 30 credits (25%) satisfies the requirement of not less than 30 credits.

Reviewers confirm the subjects are not repetitive and are spread evenly. Content of the study subjects is compliant with the type and level of studies. Basics of geoinformatics are scheduled in the first semester, while second and third semesters are oriented more on solutions applied in natural science operated by GIS tools and under geoinformatics techniques. However following the feedback from the meeting with social partners reviewers suggest also to introduce students to even wider scope of GIS applications (in transportation, utilities, asset management, etc), not limiting within natural science.

Based on the subject descriptions (SER page 15-18) the programme complies with the formal requirements (ECTS, Decree of the Lithuanian Science Council, etc). Percentages of contact hours (25%), Research work (15%), Final thesis (25%) and self-dependent work (35%) are compliant to the defined requirements for the curricula of the study programmes. Reviewers were impressed by a wide variety of the elective courses to such relatively small group of students. This was achieved in combination of similar subjects across other study programmes in the University.

During the visit students expressed a satisfaction about remote lectures and involvement of highly appreciated lecturers from abroad, which bring not only additional content to the curricula, but well contribute to the quality of learning outcome addressing issues at international or regional domains. This also helps students of learning and more practicing English.

Reviewers appreciated the E-learning Moodle application used for providing rich and comprehensive teaching content, well-structured lessons and exercises (tests). Students and teachers apply remote learning by *webinars* or skype sessions. Both parties are satisfied by remote learning means offering the lessons to be provided in flexible timing and from distributed location. Hence reviewers noted an interest of students participating in a group for remote lessons using the specific class for this purpose.

Reviewers highly appreciated the focus of the curriculum toward a group work and the independent student's activities. The study subjects are well balanced, avoid overlapping and organised in such a way of achieving proper level of flexibility. Students demonstrated high quality standards in remote learning, which, considering the fact of working practice for most of them, positively contribute to a motivation of studying in the study programme. During the visit students were keen in even more flexibility of subjects in schedule, expressed an interest in more elective subjects and research, more lessons in English.

### **3. Staff**

Reviewers expressed a satisfaction of the list of the solid staff members. According to the section 2.3 in SER the study programme is served by: 11 professors (4 of them are Habil. Dr.), 9 associated professors, 2 doctors and only one lecturer as the invited guest without academic degree, but with good reputation on technical works. 4 persons are working as technicians in the Department of Computer Science. They are in charge of practical works and labs. According to SER total number of involved staff members is 23. In addition 4 persons (mostly post graduate PhD students) assist teachers working as technicians (engineers). Their responsibility is limited to delivering practical works and supporting students in laboratories or computer classes using equipment and software/hardware.

Staff members are well diverted along the different science (subjects) – the research areas based on the Annex II of SER vary from physical sciences (Hydrobiology, Geology, Ecology, Coastal Zone Management, Oceanography.) to Fundamentals (Data Acquisition and Processing, Geostatistics, Ergonomics) and Technology & Applied Sciences (GIS, Engineering, Machine Learning, etc.). Teachers combine dissimilar knowledge and experience. All staff members except some of post PhD graduates involved in assisting the teachers bear more than 10 years of professional experience. Three teachers work as invited guests from abroad.

Reviewers confirm that the qualifications, the teaching and professional experience as well as demonstrated deep knowledge of the expertise are adequate to ensure the learning outcomes. The staff members built a solid team of high qualified experts. All teachers have published articles; some like prof. dr. Vitalijus Denisovas (currently the Dean) are authors of textbooks.

12 students took a part in the academic year 2012-2013 enrolling full time Master of Science studies. The average ratio of 2 teachers for 1 student gives more than appropriate level of available expertise and learning capacities. Based on the CV's of the available staff members (SER, Annex 3) five highly experienced professors are permanently involved to the study programme.

Reviewers confirmed the teaching staff turnover is satisfactory and adequate to the provision of the programme outcomes. The turnover of assistances is higher than teachers, but again, this does not affect the teaching quality.

During the visit reviewers were satisfied with friendly atmosphere and mutual collaboration between students and staff members. Some of teachers like prof. dr Dalia Baziukė produced joint articles with students though it was not demanded by University rules. Also administrative staff assured reviewers on continuous qualification learning measures to improve knowledge and skills of the staff members. Besides the participation in research projects this include participation in conference, workshops, reading articles, etc.

University organises internal certification of teachers according to the requirements defined by the Senate of the University. The current qualification requirements according to positions of the teachers comply to the Senate decision No. 11-48, approved at 5th April 2013.

Reviewers were particularly pleased with high motivation and professionalism of the teaching staff. Teachers and administration well coordinate the study programme with research and practical applications demonstrating usefulness of the learning outcomes to nature's preservation and impacts to society. Many teachers and administration are deeply involved to international research projects directly related to the study programme. This was acknowledged by reviewers as undisputable merit. The transfer of teachers' knowledge and best practice cases strongly benefit students.

#### ***4. Facilities and learning resources***

The study programme is delivered in the premises of Klaipėda University. Around 25 rooms are used for the programme at the building of the Faculty of Mathematics and natural Science of KU – it is about 3200 sq. m in 4 floors. The classrooms contain 25-35 seats, two big auditoriums comprises up to 95 seats each. In addition students use 4 specialised computer classes of about 60 computer workplaces in total. One class of 30 seats is specialised for participating in distance learning, one laboratory room of 25 seats is furnished for specific research purposes.

During last two years two big auditoriums were refurbished and one auditorium was equipped with an interactive blackboard.

SER page 25 provides information about the new facilities of specialised class rooms, labs and the newly created laboratory of Geosciences, training and equipment for studies shall be arranged in the frame of the project „Designing of the Nucleus of the Marine Valley and Updating of the Infrastructure of Studies“ (JŪRA) (2009-12-31 No. VP2-1.1.-ŠMM- 04-V-01-003). The project status was discussed during the meeting with the Dean and he assured reviewers the project is going to meet the objectives delivering the necessary equipment and goods.

The information about learning resources is presented in the SER pages 23-26 and was checked during the visit to University. The noted components:

- GIS software licenses: ESRI software (ArcGIS), Quantum GIS, gvSIG, GRASS.
- Statistical analysis, Simulation Modeling software licenses: SPSS, MAPLE, MATLAB, SHYFEM, EUTRO, SWAT. SWAN, ModelMaker, Model Builder, PoweSim Studio, etc.
- Remote sensing applications: BEAM, Bilko, Sony Vegas Pro.
- 10 new sets of electronic teaching material covering main Geoinformatics study programme subjects are available and described in in SAR, page 25 through the virtual learning environment (<http://vma.ku.lt/moodle2>).
- Surveying and bathymetry equipment.

The checked software are up to date, represents both world leading proprietary tools and well known tools from open source communities. It meets basic requirements for the learning material obtaining useful skills following the programme's subjects. Some of software components are available online from server based core applications. Though the available equipment satisfies the programme's curriculum, however the reviewers encourage the administration possibly utilise other popular GIS and CAD (Computer-Aided Design) software packages like MapInfo, Geomedia, Bentley Systems, etc., operate wider range of different spatial formats like GML, XML, Oracle Spatial etc.

Reviewers visited computer classrooms and two server rooms, which provide not only fast internet connection (optic fiber up to 1 Gbps), but also serve as regional node of Lithuanian academic network LITNET sharing wide resources amongst a number of universities in Lithuania. The server equipment is modern and upper class for assuring high speed operational capacities for students and staff. However the hardware in classrooms are not up to date, especially the monitors, but despite the limited efficiency performance it satisfies the requirements for management of GIS software resources.

Teachers widely use Moodle application for e-learning purpose. The application works well and is rich in filled content descriptions and exercises of each subject. Reviewers paid attention of the staff to possible improvement of the available distance learning material on Geographical Information Systems, standards, applied areas, etc, provided by National Land Service under the Ministry of Agriculture. The material was produced in collaboration with Malaspina Colledge University in the frame of ESF project „Lietuvos geografinės informacijos valdytojų kvalifikacijos kėlimas“ (Nr. BPD2004-ESF-2.2.0.-02-05/0143)

Exhaustive learning resources are available in the fund of Klaipeda university library (SER page 25). Students and teachers are able to benefit from electronic catalogue of central libraries <http://ku.library.lt> , access to the libraries of other academic institutions in Lithuania. Faculty of Natural Sciences and Mathematics provides free access to the subscribed databases of scientific publications: eBooks Academic Collection EBSCO, KTU eBooks; Academic Search Complete, Nature, Oxford Journals Online, Oxford Reference Online, Science Online, SciVerse (Science Direct), Springer Link , Taylor & Francis, Wiley Online Library. The library can borrow books from other libraries of the world via an Inter-Library Lending Department system. Among 17 packages of electronic databases, one of the most useful (especially for Master students and researchers) is the availability of full-text IEEE/IEE database of scientific journals, proceeding and standards.

Apart of the in-house information teachers and students use state georeferencial datasets from national geoportal ([www.geoportal.lt](http://www.geoportal.lt)). Reviewer may recommend putting efforts in arranging wider range of airborne and satellite data for spatial analysis in practical exercises.

Students are offered an opportunity to participate in sport activities. University maintains suitable sport infrastructure.

Reviewers visited the premises and confirm that the teaching and learning equipment are adequate both in size and quality for achieving the programme outcomes. Furthermore the furniture shall be renewed as it is planned already following the explanations of Dean. Also in general the University maintains adequate arrangements for students' practice.

### **5. Study process and student assessment**

According to the information provided in the SER (pages 26-30), the admission requirements are the following:

- Enrolment without examinations ;
  - Students graduated Bachelor's degree in computer science, informatics engineering and mathematics.
  - Competition point for entrants consists of sum of two components: average mark of Bachelor's diploma supplement marks and assessment mark of final thesis (degree project). The authors of scientific publications receive an additional point to the sum.
  - In case of similar results a priority is granted to persons possessing higher assessment for final degree project.
- Enrolment by examinations (test);
  - Students with Bachelor's degree in physics and biophysics, physical geography, ecology, economics, management, business administration and communication.

A competitive score formula:  $KB=V+B(T)$ , where KB - competitive score, V - Bachelor's degree average mark, B - Final Bachelor's Thesis evaluation mark or T - entrance exam mark.

State funding is available for 4-5 students out of 5-7 candidates. Study fee is 3800 Lt per semester for those are off state funded positions. Reviewers acknowledged that the admission requirements are clearly defined and are provided to public via the University and Faculty websites, AIS and Facebook. Timetables and the principle of assessment are available on the faculty notice board and by website.

Based on SER pages 27-30 and receiving feedback from the visit reviewers confirm that students are well supported, have opportunities in participating in international events (International Student Conference, Society of Young Researchers, annual conference). University offers suitable terms to participate in mobility programmes. However administration shall put more efforts encouraging the students and staff participating in mobility programmes like ERASMUS. The conversations with students and teachers showed that only one student and one professor took part in the exchange visits abroad. The major constrains from the ERASMUS visits were noted as difficulties in professional activities (someone shall take care about the ongoing activities at the absence of the person), family reasons and uncertainty of adaption to foreign environment. According to reviewers the administration could more investigate in providing measures for overcoming the mentioned constrains and raising benefits.

Meeting with students showed that almost all students are employees. The studies are organised in such a way that students have an opportunity to combine their studies and jobs. Students of assessed study are socially supported by University. They are entitled of using the university facilities: high speed internet, hardware, rooms, software, campus, canteens, etc.

Many staff members are involved to different activities collaborating and doing research in the teams of international research projects. Naturally due to high qualification demands students have limited possibilities being involved to the research projects, but at least they are benefitting of the transferred knowledge and best practice cases provided by teachers.

Reviewers confirmed the assessment rules are clear and available for students and staff – students have a possibility to enter the AIS under study modules, final assessment marks, intermediate marks. Every semester ends with examination session. Knowledge of students is graded in 10 point marking system. Positive grading: 10 (excellent), 9 (very good), 8 (good), 7 (average), 6 (satisfactory), 5 (poor), whereas 1, 2, 3, 4 go for negative grading (bad, unsatisfactory). The final assessment mark for any subject is calculated based on criteria established and described in the study model programme.

SER page 29 provides following requirements in the cases of student's debts: *Students who have no more than three academic debts (having failed exams (credit tests) during the exam session and the exam re-taking session), on Dean's permission, may continue studies as paying students and pay a full tuition fee. Students are allowed to do that twice during the period of studies.* During the visit students and staff members confirmed being informed about the terms, but did not applied in practice during the two years of the study programme simply because students managed with the debts in the given timeframe.

Rules for Final thesis preparation are clear and publicly available from the Department's website. Final work evaluation process:

- Preliminary evaluation by the supervisor;
- Department's consideration;
- Permission for public defence by two reviewers with a scientific degree;
- 5 Board of Defence members are approved by the Rector;
- The evaluation criteria: the content, evaluation of reviewers, student ability to present the material and answer to theoretical, methodical and practical questions.
- The reviews and the supervisor opinion should be written according to the requirements.

The first graduates completed the studies in 2013, all passed exams and defended thesis. Reviewers revised the thesis and confirm that professional activities of the majority of graduates meet the programme providers' expectations. However reviewers were concerned about the thesis of one student. The thesis in content and size looked weak and therefore posed doubts if such theses are appropriate evaluated. Reviewers recommend taking care about proper quality management defining clear criteria and following those in evaluating final thesis.

The meeting with graduates and social partners demonstrated usefulness of the obtained skills and knowledge in the study programme. However some of the graduates are not working in the domain of the completed studies, though social partners declared strong demand for the graduates of the study programme.

## **6. Programme management**

Reviewers confirmed that the management terms and procedures as well as responsibilities of decision makers are clear and well documented.

According to SER page 31 and the feedback from the visit the study programme is managed in three levels:

- Department: Head is in charge and optionally student representatives from the Student union are involved.
- Faculty: permanent Commission: according to the text in SER page 31 "*Three members of the Commission participate in the assessed study programme*";
- University: operative management decisions made by the Study and Science Department of KU and the vice-rector of academic affairs. New study programmes

and proposed changes in the existing programmes are also discussed by the Academic Commission of the Senate.

As described in SER page 32 and commented by Dean at the meeting the Commission evaluates and approve the programme subjects and make proposals for corrections. At the University level Study and Science Department is in charge.

The information, data and implementation about the programme are collected and stored in regular basis of two years, published in "Book of Study Programs". All study documents are preserved for 5 years after the study. Reviewers were pleased that the study programme documentation including subject module descriptions, study processes, Course and Diploma works are well structured and stored in electronic form. It is available to University staff and students online using the extensive AIS.

The university has implemented the comprehensive Quality Assurance programme, approved by Rector at 2006-01-30. According to the QAP the subject modules are regularly certified by the Faculty Commission. Improvements in the programme's organisation are considered from students' web based survey, discussions with students and teachers, consultations with social partners (Information Society Development Committee of the Governor Administration of Klaipėda County, Klaipeda Municipality IT and GIS Departments, Lithuanian Computer Society, Baltic Valley Association, Environmental ministry departments, joint-stock companies "HNIT-Baltic", "Omega Technology", "Koris", etc.).

During the meeting with social partners reviewers received a strong commitment to sustain the study programme. Quality assessment with students, teachers and graduates was processed by collecting answers to the questionnaires and in bilateral meetings with administrative staff. The intensive professional relations with teachers from abroad help in not only gaining additional knowledge, but also contribute to the assessment of programme's outcomes by external view.

A number of staff members participate in the international research projects and this fact positively contributes to the quality of the programme's subject as well as provides additional content and motivation for teachers and students in utilising the learning outcomes in practical applications. Best practice of the research activities move forward novelties to be implemented to the learning modules. It also provides the ground of comparative analysis of different learning methods and techniques, gives additional flavour to quality assessment criteria.

Reviewers confirm that despite the short lifetime of the programme, University properly monitored the study process – the Faculty's Commission (SER page 31) consists of highly qualitative and proactive professors with rich pedagogical and management experiences. Reviewers kindly appreciated deep personal involvement of Dean to the programme setup, monitoring, close contacts with students and stakeholders, efforts of the programme improvement. The evaluation process was completed in regular basis and was effective involving also the University Student Association using web-based survey system. Students completed a number of questionnaires provided by the administration and Students Association. However the most value comments on programme management was delivered from discussions and bilateral meetings organised by Faculty's staff. Bearing in mind the small group of students reviewers appreciated the numerous of direct communication and even individual engagement with students, teachers and social partners (stakeholders) during the programme's quality assessment processes. It is important to note that neither students nor teachers feel any problem providing fair (even negative) comments to Dean. Based on the feedback from the visit reviewers acknowledged that the administrative staff of the Faculty managed to create very open and transparent working environment for monitoring the efficient programme management.

Meeting with the first graduates showed good appreciation of the study programme though only few graduates are currently working in the areas related to the study subject. Graduates

confessed difficulties combining studies and jobs, but due to close collaboration with the staff and the flexibility of the schedule of the curricula managed successfully. All graduates feel sympathy and respect to the University teachers, particularly admitted a professionalism and value of the foreign lecturers.

Reviewers acknowledged very clearly defined decision making processes in the evaluation and improvement of the study programme: detailed terms of reference and precise roles of handling the requests for changes are approved by Senate. Requests for changes follows pragmatic workflow - from the initiative discussed in the Assessment Commission the request follows to a review in the Dean's office involving Students Union and the Faculty Scientific Council; since Dean's office validation the request is provided to the University's Study and Science Department involving vice-rector and the Academic Commission; and then the change shall be approved by the Senate.

During the visit reviewers were impressed by staff efforts, consistency and pragmatism of the programme monitoring, evaluation and improvement means. In order to better promote the programme outcomes and attract more students to the programme in the future, the reviewers recommend to organise more intensive communication or even specific marketing campaign (marketing programme) involving a wider group of stakeholders from all over Lithuania, not limiting within the Klaipėda region.

### III. RECOMMENDATIONS

1. In order to improve the programme and considering the feedback from the meeting with students and graduates reviewers would recommend extending the programme for involving more professional practice.
2. The structure and content of curriculum looks well design, but following the feedback from the discussion with students more flexibility of subjects in schedule could be considered working in such small groups, and more lessons in English are appreciated. Also following the feedback from the meeting with social partners reviewers suggest to introduce students to even wider scope of GIS applications (in transportation, utilities, asset management, etc), not limiting to natural science.
3. In order to gain more knowledge in handling diverse data sources manipulating GIS means, the programme administration could put efforts in arranging a wider range of airborne and satellite data for spatial analysis in practical exercises.
4. Quality management of Final thesis could be improved defining clear criteria and following those in the evaluation process, avoiding gross differences in content and amount of the thesis documentation.
5. Seeking to attract more students to the programme in the future reviewers recommend to organise more intensive communication or even specific marketing campaign (marketing programme) involving a wider group of stakeholders from all over Lithuania, not limiting within the Klaipėda region.

### IV. SUMMARY

The *Geoinformatics* Master of Science study programme, which is delivered by Klaipėda University, belongs to *Environmental Science* study field. The Master study programme was launched in 2011. The *Faculty of Natural Sciences and Mathematics* provides most of the special education subjects of the study programme and is responsible for the supervision of the final thesis of the students. The major documentation of the study programme was produced and further updated implementing the project *Improvement of the II Cycle Studies of the Marine Sector JŪREIVIS* executed by the Agency of the European Social Fund and Klaipėda University.

The programme evaluation by external reviewers was conducted at the first time. The external evaluation was completed by analysing the documentation from Klaipėda University and considering findings during the visit on 20th November 2013. Reviewers acknowledged due to the short period (2 years) of the programme activities limited information was available concerning the post graduates and the feedback about their appreciation by stakeholders.

Reviewers confirm the programme satisfies the requirements of the Decree of the *Lithuanian Science Council* and the *Government*. The programme aims, learning outcomes and qualification criteria are clear, well defined and publicly available through the University website, the Faculty website, *Facebook* of University and the Faculty and by the specific web based *Academic Information System* and printed materials. Also the study programme was communicated and discussed with students at the beginning of the courses and with public and private authorities of the Klaipėda region. The study programme has good inter-disciplinary

connection to other university's programmes. Reviewers were pleased to see the proofs of regular discussions of programme improvements and suggestions for changes even in such short period of two years.

University offers suitable terms to participate in mobility programmes, but students and teachers shall deal with a number of constrains due to language skills and breaks in professional activities. Therefore reviewers suggest the administration could more investigate in providing measures for overcoming the mentioned constrains and raising benefits in more active involvement to mobility programmes.

Reviewers considered a wide scope of subjects in study programme and the methodology obtaining skills and knowledge well meet the demands of potential employers. Good connection with the research in marine applications, acquiring of modern technologies (software, hardware) and high quality of graduates' skills were acknowledged as strong sides by social partners and the reviewers accordingly. Reviewers congratulate the intensive University professional relations with high educational institutions abroad. Students appreciated the lessons given by foreign lectors in English.

Curriculum is well designed. Reviewers highly appreciated the focus of the curriculum toward a group work and the independent student's activities. The study subjects are well balanced, avoid overlapping and organised in such a way of achieving proper level of flexibility, but also offering students a wide choice of elective subjects.

Reviewers were particularly pleased by high qualification, strong motivation and professionalism of the staff. The staff members build solid team of high qualified experts and in addition managed to create open and transparent working environment. Teachers are well diverted along the different sciences, combine dissimilar knowledge and experience. Administration and teachers well coordinate the study programme with research and practical applications demonstrating usefulness of the learning outcomes to nature's preservation and impacts to society. Many staff members are deeply involved to international research projects directly related to the study programme. This was acknowledged by reviewers as undisputable merit. The transfer of teachers' knowledge and best practice cases strongly benefit students for achieving better content of the learning outcomes, its realisation in practice. Best practice of the research activities also move forward novelties to be implemented to the learning modules.

The library offers different types of publications and free access to subscribed databases of prestigious and well known scientific publications. The visited premises, teaching and learning equipment despite some of outdated furniture, software and hardware components are adequate both in size and quality for achieving the programme outcomes. The checked GIS and other software are up to date, represents both world leading proprietary tools and well known applications from open source communities. Reviewers appreciated the E-learning *Moodle* application used for providing rich and comprehensive teaching content, well-structured lessons and exercises (tests). Students and teachers apply remote learning by webinars or skype sessions. Both parties are satisfied by remote learning means offering the lessons to be provided in flexible timing and from distributed location. Reviewers concluded that in general the University maintains adequate arrangements for students' practice.

Reviewers confirm that despite the short lifetime of the programme University properly monitored the study process. Reviewers kindly appreciated deep personal involvement of Dean to the programme setup, monitoring, close contacts with students and stakeholders, efforts of the programme improvement. The programme evaluation process was completed in regular basis and was effective involving also the *University Student Association*, social partners and post graduates. Based on the feedback from the visit reviewers acknowledged that the administrative staff of the Faculty managed to create very open and transparent working environment for efficient monitoring the programme management.

Reviewers acknowledged very clearly defined decision making processes in the evaluation and improvement of the study programme. Requests for changes follow the pragmatic workflow. Bearing in mind the small group of students reviewers appreciated the numerous of direct communication and even individual engagement with students, teachers and social partners (stakeholders) during the programme's quality assessment processes. During the visit reviewers were impressed by staff efforts, consistency and pragmatism of the programme monitoring, evaluation and improvement means.

## V. GENERAL ASSESSMENT

The study programme *Geoinformatics* (state code – 621F74001) at Klaipėda University is given **positive** evaluation.

*Study programme assessment in points by evaluation areas.*

No.	Evaluation Area	Evaluation Area in Points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	3
3.	Staff	4
4.	Material resources	3
5.	Study process and assessment (student admission, study process student support, achievement assessment)	3
6.	Programme management (programme administration, internal quality assurance)	4
	<b>Total:</b>	<b>20</b>

\*1 (unsatisfactory) - there are essential shortcomings that must be eliminated;

2 (satisfactory) - meets the established minimum requirements, needs improvement;

3 (good) - the field develops systematically, has distinctive features;

4 (very good) - the field is exceptionally good.

Grupės vadovas:  
Team leader: Prof. dr. Bernd Teichert

Grupės nariai:  
Team members: Prof. dr. Mercedes Farjas  
Prof. Janusz Uriasz  
Dr. Saulius Urbanas  
Gražvydas Jakaitis

<...>

#### V. APIBENDRINAMASIS ĮVERTINIMAS

Klaipėdos universiteto studijų programa *Geoinformatika* (valstybinis kodas – 621F74001) vertinama **teigiamai**.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	3
2.	Programos sandara	3
3.	Personalas	4
4.	Materialieji ištekliai	3
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	4
	<b>Iš viso:</b>	<b>20</b>

\* 1 - Nepatenkinamai (yra esminių trūkumų, kuriuos būtina pašalinti)

2 - Patenkinamai (tenkina minimalius reikalavimus, reikia tobulinti)

3 - Gerai (sistemiškai plėtojama sritis, turi savitų bruožų)

4 - Labai gerai (sritis yra išskirtinė)

<...>

#### IV. SANTRAUKA

Magistro laipsnio studijų programa *Geoinformatika*, kurią vykdo Klaipėdos universitetas, priklauso Aplinkotyros studijų kryptiai. Magistrantūros studijų programa pradėta vykdyti 2011 m. Gamtos ir matematikos mokslų fakultete dėstoma dauguma šios studijų programos specialiųjų dalykų, fakultetas atsako ir už studentų baigiamųjų darbų priežiūrą. Pagrindiniai studijų programos dokumentai yra parengti ir toliau atnaujinami pagal projektą „Jūrinio sektoriaus II pakopos studijų tobulinimas (JŪREIVIS)“, kurį įgyvendino Europos socialinio fondo agentūra ir Klaipėdos universitetas.

Išorės ekspertai programą vertino pirmą kartą. Išorinis vertinimas buvo baigtas išanalizavus Klaipėdos universiteto pateiktus dokumentus ir atsižvelgus į per 2013 m. lapkričio 20 d. apsilankymą surinktą informaciją. Ekspertai pripažino, kad dėl trumpo programos vykdymo laikotarpio (2 metai) surinkta informacija apie baigusius absolventus yra ribota, taip pat ir grįžtamasis ryšys, kaip juos vertina socialiniai partneriai.

Ekspertai patvirtina, kad programa atitinka Lietuvos mokslo tarybos ir Vyriausybės nutarimo reikalavimus. Programos tikslai, studijų rezultatai ir kvalifikacijos kriterijai yra aiškūs, tinkamai apibrėžti ir viešai prieinami Universiteto tinklalapyje, fakulteto tinklalapyje, Universiteto ir fakulteto socialiniame tinkle *Facebook* ir konkrečiuose akademinės informacijos sistemos žiniatinkliuose ir spausdintoje medžiagoje. Studijų pradžioje ši studijų programa taip pat buvo aptarta su studentais, Klaipėdos regiono valstybinėmis ir privačiomis institucijomis. Studijų programa gerai susieta su kitomis Universiteto programų disciplinomis. Ekspertams buvo malonu matyti, kaip vyksta nuolatinės diskusijos dėl programos tobulinimo ir teikiami siūlymai keisti net ir per tokį trumpą dvejų metų laikotarpį.

Universitetas siūlo priimtinas sąlygas dalyvauti judumo programose, tačiau studentai ir dėstytojai susiduria su problemomis dėl kalbos įgūdžių stokos ir profesinės veiklos pertraukimo. Todėl ekspertai siūlo administracijos atstovams išsamiau išnagrinėti ir numatyti priemones, kurios padėtų įveikti minėtas problemas ir padidintų naudą, kurią teikia aktyvesnis dalyvavimas judumo programose.

Ekspertai įvertino daug dalykų, kurie dėstomi studijų programoje, metodikas, taikomas įgūdžiams ir žinioms įgyti, ir nustatė, kad jie tenkina galimų darbdavių poreikius. Geras ryšys su tyrimais, atliekamais jūrinėse programose, šiuolaikinių technologijų įsigijimas (programinės ir techninės įrangos) ir aukštos kokybės absolventų įgūdžiai buvo pripažinti stipriosiomis pusėmis, ką pripažino ir socialiniai partneriai, ir ekspertai. Ekspertai sveikina aktyvius universiteto profesinius ryšius su aukštojo mokslo įstaigomis užsienyje. Studentai vertina paskaitas, kurias skaito užsienio lektoriai anglų kalba.

Studijų programa sudaryta gerai. Ekspertai labai teigiamai vertina, kad dėmesys sutelkiamas į darbą grupėse ir savarankišką studentų darbą. Studijų dalykai gerai dera, nėra dubliavimosi, tačiau išdėstymą reikėtų suorganizuoti taip, kad būtų užtikrintas tinkamas lankstumo lygis, išlaikant studentams platų pasirenkamųjų dalykų spektrą.

Ekspertus ypač maloniai nustebino darbuotojų aukšta kvalifikacija, stipri motyvacija ir profesionalumas. Dėstytojai subūrė tvirtą aukštos kvalifikacijos ekspertų komandą, be to, jiems pavyko sukurti atvirą ir skaidrią darbo aplinką. Dėstytojai yra tinkamai nukreipti į įvairius mokslus, jie derina skirtingas žinias ir patirtį. Administracija ir dėstytojai gerai koordinuoja studijų programą su moksliniais tyrimais ir praktiniu taikymu, tai įrodo studijų rezultatų naudą gamtos išsaugojimui ir poveikiui visuomenei. Daugelis darbuotojų aktyviai dalyvauja tarptautiniuose mokslinių tyrimų projektuose, susijusiuose su studijų programa. Ekspertai tai pripažino neginčijamu nuopelnu. Dėstytojų žinių ir geriausios praktikos perdavimas studentams ypač naudingas siekiant geresnių studijų rezultatų ir juos taikant praktikoje. Mokslinių tyrimų veikla ir geriausia praktika padeda įgyvendinti naujoves mokymosi moduluose.

Biblioteka siūlo įvairių leidinių ir laisvą prieigą prie prestižinių ir gerai žinomų mokslo leidinių prenumeruojamų duomenų bazių. Patalpos, kuriose lankėmės, dėstyto ir mokymosi įranga, nepaisant kai kurių pasenusių baldų, programinė ir techninė įranga yra tinkami savo apimtimi ir kokybe programos rezultatams pasiekti. Patikrinta GIS ir kita programinė įranga yra atnaujinta, galima naudotis tiek pasaulyje pirmaujančiomis patentuotomis priemonėmis, tiek gerai žinomomis atvirojo kodo bendruomenės taikomosiomis programomis. Ekspertai vertina tai, kad e. mokymosi aplinka *Moodle* naudojama teikiant kokybišką ir išsamų studijų turinį, tinkamai apgalvotas paskaitas ir užduotis (testus). Studentai ir dėstytojai taiko nuotolinį mokymąsi rengdami seminarus internetu arba *skype* sesijas. Abi šalys yra patenkintos nuotolinio mokymosi priemonėmis, kurios leidžia dėstyti užsieniui lanksčiai priimtinu laiku ir iš buvimo vietos. Ekspertai padarė išvadą, kad, apskritai, Universitetas yra sudaręs atitinkamus susitarimus dėl studentų praktikos.

Ekspertai patvirtina, kad, nepaisant trumpo programos gyvavimo laiko, Universitetas tinkamai kontroliuoja studijų procesą. Ekspertai labai vertina dekanų aktyvų asmeninį indėlį rengiant ir kontroliuojant programą, palaikant glaudžius ryšius su studentais ir socialiniais partneriais, pastangas tobulinti programą. Programos vertinimo procesas buvo baigtas įprastai, jame veiksmingai dalyvavo Universiteto studentų asociacija, socialiniai partneriai ir doktorantai. Remdamiesi vizito Universitete grįžtamuju ryšiu, ekspertai pripažino, kad fakulteto administracijos darbuotojai sugebėjo sukurti labai atvirą ir skaidrią darbo aplinką veiksmingai programos vadybos stebėsenai užtikrinti.

Ekspertai pripažino, kad yra sukurtas labai aiškiai apibrėžtas sprendimų priėmimo procesas įvertinant ir tobulinant studijų programą. Prašymai dėl pakeitimų atliekami įvertinus pragmatišką darbo eigą. Turint omeny, kad studentų grupelė yra labai maža, ekspertai vertina daugybę tiesioginio bendravimo ir net individualų bendravimą su studentais, dėstytojais ir

socialiniais partneriais (suinteresuotomis šalimis) vertinant programos kokybę. Vizito universitete metu ekspertai buvo sužavėti darbuotojų pastangomis, programos stebėsenos, įvertinimo ir gerinimo priemonių nuoseklumu ir pragmatiškumu.

### III. REKOMENDACIJOS

1. Siekdami patobulinti programą ir atsižvelgę į informaciją, gautą per susitikimus su studentais ir absolventais, ekspertai rekomenduoja išplėsti programą ir įtraukti daugiau profesinės praktikos.
2. Studijų programos struktūra ir turinys atrodo gerai parengti, tačiau atsižvelgus į per diskusijas su studentais išsakytas pastabas, dalykų tvarkaraštis turėtų būti lankstesnis ir galėtų būti dirbama mažose grupėse, taip pat būtų gerai, jei daugiau paskaitų būtų anglų kalba. Atsižvelgdami į susitikimo su socialiniais partneriais rezultatus, ekspertai siūlo supažindinti studentus su dar platesniu GIS taikomųjų programų naudojimu (transporto, komunalinių paslaugų, turto valdymo ir kitose srityse) ir neapsiriboti tik gamtos mokslais.
3. Siekiant įgyti daugiau žinių, kaip dirbti su įvairiais duomenų šaltiniais taikant GIS priemones, programos administracijos atstovai galėtų labiau pasistengti ir gauti daugiau iš orlaivių ir palydovų gaunamų duomenų erdvinei analizei per praktinius užsiėmimus atlikti.
4. Galėtų būti patobulinta baigiamųjų darbų kokybės vadyba nustačius aiškius kriterijus ir vadovaujantis jais vertinimo procese siekiant išvengti didžiulių baigiamųjų darbų dokumentacijos turinio ir apimties skirtumų.
5. Siekiant pritraukti daugiau studentų į programą ateityje, ekspertai rekomenduoja rengti intensyvesnes ryšių ar net konkrečias rinkodaros kampanijas (rinkodaros programa), kurioje dalyvautų platesnė suinteresuotųjų šalių grupė iš visos Lietuvos ir neapsiribotų tik Klaipėdos regionu.

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