STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

KAUNO KOLEGIJOS

GEODEZIJOS (653H14003)

VERTINIMO IŠVADOS

EVALUATION REPORT

OF *GEODESY* (653H14003)

STUDY PROGRAMME

AT KAUNAS COLLEGE

Grupės vadovas:
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Išvados parengtos anglų kalba
Report language - English

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	**Geodezija**
Valstybinis kodas	653H14003
Studijų sritis	Technologijos mokslai
Studijų kryptis	Bendroji inžinerija
Studijų programos rūšis	Koleginės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (3), ištęstinė (4.5)
Studijų programos apimtis kreditais	180
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Matavimų inžinerijos profesinis bakalauras
Studijų programos įregistravimo data	26-08-2002 Nr. 1484

INFORMATION ON ASSESSED STUDY PROGRAMME

Name of the study programme	**Geodesy**
State code	653H14003
Study area	Technology Sciences
Study field	General Engineering
Kind of the study programme	College studies
Level of studies	First
Study mode (length in years)	Full-time (3), part time (4.5)
Scope of the study programme in credits	180
Degree and (or) professional qualifications awarded	Professional Bachelor of Measurements Engineering
Date of registration of the study programme	26-08-2002 No 1484

CONTENTS

I. INTRODUCTION

The Geodesy study programme (field of study: general engineering, branch: measurement engineering) is delivered by the Department of Geodesy of the Faculty of Landscaping of the Kauno Kolegija/University of Applied Sciences (hereinafter Kaunas College). The history of the department dates back to 1927, when the school of culture technicians, where geodesists were trained, was established on the estate of count Totleben in Kėdainiai.

The Kaunas College was established in 2000 by a merger of further education schools of technology and economics. With about 7300 students and a teaching staff amounting to about 600, it is one of the biggest state-funded higher education institutions, not only in Lithuania but also in the Baltic region. The Faculty of Landscaping cares for about 800 students, following five programmes of study, including Real Estate Cadastre System, which is not subject of the present review.

In 2005, Kaunas College became an accredited higher education institution, and in 2007 it was granted the right to award professional bachelor's degrees. The Geodesy study programme was accredited in 2006. In 2011, the programme was renewed and redesigned to fit the request for a higher education, structured by means of cycle of studies, learning outcomes, and ECTS. Thus, the Programme stipulates 3 years for full-time studies and 4.5 years for part-time studies, and provides 180 ECTS.

II. PROGRAMME ANALYSIS

1. Programme aims and learning outcomes

Description of the background as well as rationale of the need for the programme including national and international references is clearly outlined in the Self-Analysis Report Summary. The study programme is well received by employers, with whom Kaunas College has good and formalized relations. The review team found that it would be useful for the management of the programme to map the area of influence of the particular study programme on a national scale as well as relate it to other institutions providing similar education.

The aims of the programme are divided into two categories: 1) to provide knowledge, skills and abilities required for a modern surveyor; 2) to educate specialists with interpersonal and creative thinking skills able to work in a team, make independent decisions and assume responsibility, and striving for professional development. The learning outcomes of the

programme are focused on general engineering field (H100), measurement engineering branch (H140) and are based on requirements for first study cycle professional bachelor programmes (professional requirements, public needs and the needs of the labor market). The graduate of this study programme is awarded a bachelor's of measurement engineering degree. The name of the programme, its learning outcomes, content and the qualifications offered are therefore compatible with each other.

The programme aims and learning outcomes are clear and well defined. The further development of learning outcomes may benefit from comparing with the study resources provided by the Canadian Board of Examiners for Professional Surveyors (CBEPS), especially learning outcomes for each of the 11 core and 4 elective subjects in geodesy, etc. See https://www.cbeps-cceag.ca/study-resources.

Curriculum design of the study programme is based on aims of the study programme and learning outcomes. The staff has solid understanding on relating aims and learning outcomes of the programme to particular subjects (modules) as well as teaching methods and student evaluation system. Teachers have been provided with courses training competences in adopting Dublin descriptors (2004).

The aims and learning outcomes of the study programme are publicly accessible using various communication tools. However, the concept is not entirely understood by employers and this problem is known to the self-analysis group. The review team encourage arranging a workshop to explain the new credit system as well as the concept of learning outcomes to stakeholders which was outlined in the Self-Analysis Report as a corrective measure for the problem in question.

2. Curriculum design

There are two learning forms: full-time and part-time studies which are well balanced and part-time studies are well received.

Besides that the college participates in European Erasmus exchanges programs. Students participating in these programs are positive about their experiences

- *The curriculum design must meet legal requirements;*

Section 2.2.1 of the SER explains how the curriculum design complies with the legal requirements. The review team found this to be correct.

- *Study subjects and/or modules must be spread evenly, their themes should not be repetitive;*

Section 2.2.2 of the SER describes the structure of the curriculum and its internal logic and consistency. The review team found this to be correct. Curriculum design is well

prepared and the courses do not overlap. There is a communication between teachers concerning these issues as well as regular meetings.

- *The content of the subjects and/or modules must be consistent with the type and level of the studies;*

Section 2.2.3 of the SER describes how the curriculum complies with the type and level of the studies. The review team found this to be correct.

- *The content and methods of the subjects/modules must be appropriate for the achievement of the intended learning outcomes;*

The study load of the curriculum appears to be adequate. This was confirmed by staff, students and alumni. Statistics show that 80% pass their exams in a first session. The fact that 50% of the students need more than the nominal 3 years to finish the full-time program is mainly due to the fact that students generally have a job besides their studies.

- *The content of the programme must reflect the latest achievements in science, art and technologies.*
  - The critical notes of the previous review have been taken care of. New instruments have been acquired, new software is available and in the curriculum more attention is paid on data processing.
  - The curriculum is updated regularly, up to 20 % per year. Program updates are properly documented. The changes are made if needed.
  - The staff is well aware of new developments in the study field and new technologies are known. These are being integrated in the courses.
  - Important in this context is that staff spend about 50% of their time on research, the exploration of new developments and staff upgrading. Research is done in fields that have been accepted by the College
  - Companies and employers visit the institution 2 – 3 times per year to give seminars to the students and staff.
  - Curriculum design meets the needs of labour market. Discussion with alumni and employers confirmed this.
  - There are three specializations: *Applied Geodesy, Geographic Information Systems, and Land-use planning.* Their content is well defined and tuned to the needs of the present professional labor market. This was confirmed by employers and alumni.
  - The students have access to (optional) courses on business management and international developments, which are relevant for the working context of the modern professional.

3. Staff

The staff involved in teaching the Geodesy study programme consists of 30 members (5 assistant professors, 18 lecturers and 7 teaching assistants. Two members of the Qualifying Board assess the final thesis. All teaching staff complies with the relevant statutory requirements. The teachers have an average experience of 15 years professional practice and 16 years teaching practice. The programme also has a full-time technical support staff with defined functions for the upkeep of hardware, software and technical equipment. They also assist in organizing practical exercises, research projects and solving technical problems. The average age is 47, with uniform distribution by age groups.

Staff qualifications are relevant and EU structural funds have been used for their improvement. In academic year 2011/12 72% of the teachers in the programme took part in subject-related training activities and 76% in ongoing teacher training. Stakeholders are also involved in the process of providing new qualification competences for teachers.

Applied research is being carried out in Geodesy (Feasibility study on the use of modern surveying equipment and software in scientific and engineering environments), Geoinformation Systems (GIS software feasibility study, digital photogrammetry, historical cartography) and Educology, and numerous papers have been published in these fields.

During the evaluation period, three teachers read their doctoral theses, 91 papers were published in academic journals (20 in peer-reviewed journals recognized by the Lithuanian Science Council), as well as 32 methodological publications. 90% of the Geodesy study programme subjects are adapted for e-learning. Twenty-three teachers have taken part or are taking part in national projects and two projects have been implemented financed by EU structural funds: (Nº BDPD2004-ESF-2.4.0-03-05/0120 “Development of innovative teaching/learning tools to improve a non-university study programme of Geoinformation Systems” and Nº BDP2004-ERPF-1.5.0-12-05/0011 “Development of geoinformation systems specialists training infrastructure focused on technological innovations and European integration”). They have also taken part in international projects with companies such as Leica Austrian and the Italian company NAVIONICS.

14 Geodesy study programme teachers are members of national associations, committees and societies, and some of them are members of its Board: the Lithuanian Surveyors Association, the Lithuanian Union of Hydro Technicians and the Lithuanian Association of Use-Planning Engineers, the Lithuanian Society of Cartographers, Society of Geometry and Engineering Graphics, UN Geographic Expert Group (Baltic Branch), Lithuanian Standardization Department TC Geographic Information, National Land Service Surveyors and Expert Surveyor Qualification Assessment Commission, Public Council of the Ministry of

Agriculture for the Improvement of Legislation Regulating the Drafting of Real Estate Cadastre and Land Use Planning Documents.

The Geodesy study programme has 22 bilateral collaboration agreements and only in 2012 the academic exchange had 27 participating teachers (10 incoming and 17 outgoing).

The teacher/student ratio in the academic year 2011/12 was 16.5. The numbers of students in the groups are adequate for learning outcomes and teaching methods used. Teacher/student ratios are analyzed at all stages. The teaching methods are adapted to programme requirements and ensure high standards.

As regards teaching staff turnover, the aim is to integrate practical knowledge into the study process. The specialization subjects are taught by 7 teacher-practitioners, who hold full-time posts in other organizations. This type of collaboration enhances the academic and applied research potential and improves the quality of studies.

At the beginning of the year each teacher prepares a teaching plan specifying contact hours, teaching methods, applied research and other activities, which are reviewed and modified in accordance with applied research activities, faculty and department priorities and the Geodesy study programme's weaknesses and strengths.

The teachers are involved in a process of continuous professional development, conduct applied research, give consultations, actively participate in professional associations, publish methodological material and disseminate best practices.

4. Facilities and learning resources

Classes are given in well-equipped classrooms and there are seven specialized laboratories for: Geodesy, Applied Geodesy, Photogrammetry and Cartography, Geographic Information Systems, Real Estate Cadastre, Land Use Planning and Measurement Results Processing. The equipment related to computer hardware, software and Geodetic measurement equipment were purchased in 2007-2008 under EU structural support project Nº BDP2004-ERPF-1.5.0-12-05/0011. They have excellent GPS receivers, mobile GPS receivers, electronic levels, electronic tachometers, optical levels, theodolites and distomats. EU structural funds were used to improve learning resources as well as facilities.

The Geodesy study programme has 2 servers with dedicated spaces for all teachers and students. Database and GIS software are located in the servers. The software used in the programme is highly innovative and consists of the latest technology in the field: Photomodeler, Image Analysis, AutoCad Civil 3D 2013, GeoMap 2013, ArcGIS, Microsoft SQL, etc. Students

are provided with a CD with the available software for ex-classroom use in their personal computers.

The equipment makes it possible to carry out an excellent programme of practical exercises. Six credits are given for Practical Training in Geodetic Measurements, 6 credits for professional practice in Digital Planning, 3 credits for practice in Geodetic Engineering Measurements, 3 credits in Precision Geodetic Measurements and 12 credits for the Final Work Placement. All students undergo practical training under supervision in business enterprises as part of the study programme under three-party agreements.

Excellent advantage is taken of the close contact with business companies to keep students up to date with the latest technological developments (e.g. in 3D laser scanner systems).

During the evaluation period, teachers involved in the programme published 32 methodological books.

The library is equipped with excellent material in both basic science subjects and sciences related to the study programme. The bibliographic references available are kept up to date and exist in several languages. There is access to e-book repositories.

Learning and methodological material for all the Geodesy study programme subjects is available in the Moodle virtual learning environment. Within the EU structural support Project Nº BDPD2004-ESF-2.4.0-03-05/0120 “Development of innovative teaching/learning tools to improve a non-university Geoinformation Systems study programme” learning tools were developed for 8 subjects, and literature in foreign languages was purchased for LTL 11.000.

In the period 2007-2012, the library purchased 3482 copies of 507 new publications for the Geodesy study programme (103.248 LTL), 132 copies of 110 titles in foreign language, 10 new publications by teachers, and 23 periodical publications.

During the project “Internationalization and upgrading of study programmes delivered in the Kauno Kolegija Faculty of Landscaping and adjusting them for foreign students” implemented in 2011-13, learning resources for LTL 29.000 were purchased. The teaching material for 16 subject of the Geodesy study programme is at present being translated into English.

From the foregoing it can be concluded that equipment and resources of the study programme can be considered as excellent.

5. Study process and student assessment

The admission requirements are based on a competition score which takes account of the secondary education or equivalent education. The scores indicate adequate ability to undertake the program. The number of entrant's students decreased from 88 in 2007 until 65 in 2012.

The assessment procedures are clearly described and publicly available at the university's website. Topics for final thesis are not suggested by the stakeholders, yet students may select the topics. Generally, the organization of the study process ensures an adequate provision of the programme and the achievement of the learning outcomes. Classroom work (lectures, seminars, practical, laboratory works) are evenly distributed – theoretical lectures are followed by practical classes. The equipment in the laboratories is modern and didactically well positioned – it reflects the intensive cooperation with regional companies, not only by the students.

Study oriented to practical professional work. All the students have internship in companies. Moodle system is working and most of the courses are well managed. Correlation between theory and practice is well managed. Graduates recommended providing more knowledge of law.

Students are involved in applied research activities and some have presented their work at conferences. Students of the programme have also been involved in improvement projects at College level. The students have access to good sports, health and cultural facilities (choir, dance and sports groups). There is an active Kaunas college Students' Association. The access of students to computer classes after the study time seems to be limited, although there is an interest in the area.

The students have access to mobility through the Erasmus Study Program. The outgoing number of students on exchange program is not stable. It ranges from 2 -11. Also, during the last 5 years, 11 students from 5 foreign universities participated in the Kaunas college study programme of geodesy. These are excellent results. It would be worthwhile to see how the international orientation of the College could be further strengthened and to explore how student international mobility could even be more encouraged and supported.[1]

Sports facilities are good and students have free access to physical education classes. Students are assigned tutors. There is significant staff/student consultation. Students with

[1] The review team considers itself allowed to propose suggestions for change, even to an exceptionally good study programme.

special needs can avail of financial assistance. Hostel accommodation is available to all students if required. The significant contribution of a Student Society to the College is fully recognized and enthusiastically supported by management, leading to a mutually respective working atmosphere of benefit to all students on the programme.

The assessment method is clear. Grades are determined to a 10-point scale. The scale used for assessment is clearly publicized to the students and is well understood. Course projects, research papers and the final thesis are assessed by grades. Assessment of coursework is assessed as a separate mark to the study module. The final thesis may only be defended when the student has successfully completed all other modules.

Students are generally happy about the evaluations. When working in groups they receive individual grade depending on the personal input. Mostly study evaluation is putting on Moodle system.

The survey of students is not organized centrally by faculty administration. Teachers organized student's survey by themselves, which is a relevant and commendable action.

The total percentage of employability by specialty in the reference period is 74.3 % and employment outside the specialty field was 9 %; 6.2 % of graduates continue post-graduate studies.

6. Programme management

Programme management procedures including supervision, application of changes at the level of the department as well as College management are well presented in the Self-Analysis Report Summary. A study programme committee which consists of staff members from the KK, social partners and student has been established. Responsibilities for decisions and monitoring of the implementation of the programme are clearly allocated and the internal quality assurance measures are efficient.

A constructive-critical attitude to quality delivery and assurance permeates the institution, as witnessed by the Self-Analysis Report Summary and confirmed through the meetings with management, teachers, students, alumni, and employers. Teachers present their annual plans as part of the self-evaluation process which is discussed at the department level. The relationship between teachers and management is well organized. The outcomes of previous evaluations of the programme have been used for the improvement of the programme. Learning resources have been improved, mobility of teachers have increased significantly.

Information and data on the implementation of the programme are collected and analyzed by teachers and supervisor of the programme. Annual questionnaires are prepared for students mostly using the Moodle system. Student board performs questionnaires as well. Yet,

the review team wonder, whether a unified system for student surveys at the KK level would be more appealing. Also, the resulting actions from the feedback could be better publicized to students to promote deeper engagement with the process.[2]

Stakeholders as well as social partners are involved in the programme management at all levels and are able to make suggestions for study programme improvement. Questionnaire surveys of stakeholders and alumni could also be considered to further identify strengths and weaknesses of the study programme.

III. RECOMMENDATIONS

1. The review team encourage arranging a workshop to explain the new credit system as well as the concept of learning outcomes to stakeholders, which was outlined in the Self-Analysis Report as a corrective measure for the problem in question. (See Section 1 of this report)
2. The further development of learning outcomes may benefit form comparing with the study resources provided by the Canadian Board of Examiners for Professional Surveyors (CBEPS), especially learning outcomes for each of the 11 core and 4 elective subjects in geodesy, etc. See https://www.cbeps-cceag.ca/study-resources

IV. SUMMARY

An external assessment of the *Geodesy* study programme at the Kaunas College (KK) took place in 2006. The Centre for Quality Assessment in Higher Education prompted the KK to prepare a Self-Evaluation Report (SER), dated Kaunas, 2013, and established an international review team to visit the College. The visit by the review team took place the 22. May, 2013. Together with the SER and its annexes, the visit provides the basis for this report. The following sub-section introduces an international and European perspective to the domain of the study programme. The closing section of the General comments briefly states the role of the institution, as perceived by the review team.

Geodetic surveyors are responsible for several products and services that are of fundamental value for the production, delivery and use of modern spatial data:

- They establish and maintain the reference coordinate frameworks for the spatial data
- They establish and maintain geodetic networks
- They establish and maintain gravity networks for the definition of height

[2] Cf. footnote 1

- They provide topographic data in the form of spatial databases and maps
- They perform cadastral surveying of real property objects for establishing and updating the real estate cadastre, and in this context use and produce legal sources for land and other real estate, to contribute to the general regulation of legal intercourse
- They perform various other technical measurements for the construction industry, building processes, deformation monitoring etc.
- They assess the quality of spatial data in the context of data delivery as well as in the assessment of relevant needs.

The challenge for professionals and academia is to identify the potential of new technology (instruments, satellites, computers, internet, etc.) for the professional domain, to demonstrate its applicability towards the benefit of society, and to assist in the implementation of new tools and practices.

Several of these geodetic services relating to the maintenance of geodetic reference frameworks refer to the shape of the earth over larger regions and have therefor always been performed in international projects and thus require international cooperation. But also on the topics of topographic and cadastral information provision we see an increasing need for international coordination and standardization, in the European context, but also in a more global context.

A number of international organizations frame this endeavor, for example the International Association of Geodesy, the International Federation of Surveyors (FIG), the International Society for Photogrammetry and Remote Sensing (ISPRS), the International Cartographic Association (ICA), the Open Geospatial Consortium (OGC), and others.

From a European perspective, the following deserve mentioning:

- The Association of Geographic Information Laboratories in Europe (AGILE),
- EuroGeographics, the membership association of the European cadastre, land registry and national mapping authorities
- EuroSDR - a European Spatial Data Research Network, which links members of the above-mentioned EuroGeographics with academia for the purpose of applied research in spatial data provision, management and delivery.
- EULIS, the European Land Information Service, ELRA, the European Land Registry Association, and the Permanent Committee for Cadastre (PCC), which together with EuroGeographics have drafted an agreement on a common vision on cooperation on European Cadastre and Land Registry.
- INSPIRE, which through the INSPIRE directive and implementation measures aims to create a European Union (EU) spatial data infrastructure, and

- the United Nations Economic Commission for Europe (UNECE), having prepared among others the UNECE Guidelines on Land Administration

Finally, especially staff and students engaged in mobility arrangements may benefit from mutual comparison of state of the art, as presented through the FIG's Cadastral Template, INSPIRE's 'State-of-play' reports, and - where available - the UNECE Land Administration Review reports.

The review team was impressed by the Self-Evaluation Report's well versed description of the relations of the study programme to the Lithuanian and further European society. The positive judgment of the study programme was further substantiated through discussions, especially concerning programme management. For example, weaknesses were addressed by management, teachers and students in an open and constructive way.

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

The study programme is well received by employers, with whom the KK has good and formalized relations. The learning outcomes of the programme are well detailed into the learning outcomes of the particular subject/module.

2. ***Curriculum design***

The curriculum is well prepared. Regular meetings provide the frame for curriculum updating. The directions of the study field and new technologies are known to the staff and are being integrated in the courses.

3. ***Teaching staff***

The qualification of the staff is relevant. The detached addressing of strengths and weaknesses may contribute to the observed optimal use of the capacities of the staff. The Department employs its own graduates.

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

EU funds were used for improvement of equipment and software used in the studies. Improvements are discussed with employing companies. Students are positive in their evaluation of equipment, etc.

5. ***Study process and students' performance assessment***

Students inform the review team that they generally are happy about their learning process and that relations between students and teachers are good. Part time studies were prolonged from 4 to 4.5 years, to accommodate for study workload. The Moodle system is in active use, about 90% of study material is available there. The dropout issue is carefully addressed.

6. ***Programme management***

A constructive-critical attitude to quality delivery and assurance permeates the institution, as witnessed by the SER and confirmed through the meetings with management, teachers, students, alumni, and employers. For example, each teacher is requested to present a plan for the subsequent year, concerning 1. Teaching, including proposals for new or revised content, 2. Research and conference participation, and 3. Own professional development. The plan is part of the teachers' current self-evaluation and is discussed, modified and approved through Study Programme Committee and Department, respectively. Thus the relationship between teachers and management is indeed well organized.

Expert group have some specific recommendations:

- The Self-Evaluation Report's recurrent statements on Corrective actions seem well addressed. For example, one action proposes a workshop on credit system/ learning outcomes for stakeholders. Such action is indeed laudable. As a national problem is addressed, the review team suggests invitations to be extended beyond the traditional KK circle of stakeholders.
- International comparisons of specifications of learning outcomes are beneficial. The review team suggest the learning outcomes concerning the Geodesy study programme be published on KK‘s portal and cross-referenced with similar specifications, e.g. the Canadian Board of Examiners for Professional Surveyors (CBEPS).

V. GENERAL ASSESSMENT

The study programme *Geodesy* (state code – 653H14003) at Kaunas College is given **positive** evaluation.

Study programme assessment in points by fields of assessment.

No.	Evaluation Area	Evaluation Area in Points*
1.	Programme aims and learning outcomes	4
2.	Curriculum design	4
3.	Staff	4
4.	Material resources	4
5.	Study process and assessment (student admission, study process student support, achievement assessment)	4
6.	Programme management (programme administration, internal quality assurance)	4
	Total:	**24**

*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.

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III. REKOMENDACIJOS

1. Vertinimo grupė skatina surengti seminarą, kuriame socialiniams dalininkams būtų išaiškinta naujoji kreditų sistema, taip pat studijų rezultatų koncepcija, kuri, kaip šios problemos sprendimo priemonė, buvo bendrais bruožais apibūdinta Savianalizės suvestinėje (žr. šių išvadų 1 punktą).
2. Studijų rezultatai gali būti toliau tobulinami juos lyginant su Kanados profesionalių geodezininkų egzaminuotojų tarybos (angl. Canadian Board of Examiners for Professional Surveyors (CBEPS)) teikiamais studijų ištekliais, ypač kiekvieno iš 11 pagrindinių ir 4 pasirenkamųjų geodezijos dalykų studijų rezultatai ir kt., žr. https://www.cbeps-cceag.ca/study-resources.

IV. SANTRAUKA

Kauno kolegijos (KK) programos Geodezija išorinis vertinimas buvo atliktas 2006 m. Studijų kokybės vertinimo centras skatino KK parengti 2013 m. Įsivertinimo suvestinę (ĮS) ir subūrė tarptautinę vertinimo grupę, kuri apsilankytų kolegijoje. 2013 m. gegužės 22 d. vertinimo grupė apsilankė kolegijoje. Šios išvados parengtos pagal įsivertinimo suvestinę (ĮS) bei jos priedus ir apsilankymo metu gautą informaciją. Tolesnėje pastraipoje pristatoma tarptautinė ir Europos studijų programos srities perspektyva. Paskutinėje Bendrųjų komentarų dalyje trumpai pristatomas institucijos vaidmuo, kaip jį suprato vertinimo grupė.

Geodezininkai yra atsakingi už kelis produktus ir paslaugas, kurie yra itin vertingi moderniems erdviniams duomenims gauti, teikti ir naudoti:

- Sukuria ir palaiko informacijos koordinuojamas erdvinių duomenų sistemas;
- Kuria ir palaiko geodezinius tinklus;
- Kuria ir palaiko gravitacijos tinklus aukščiui nustatyti;
- Teikia topografinius duomenis, būtent erdvines duomenų bazes ir žemėlapius;
- Atlieka kadastrinius nekilnojamojo turto objektų matavimus nekilnojamojo turto kadastrui kurti bei atnaujinti ir taip naudoja bei kuria teisinius žemės ir kito nekilnojamojo turto šaltinius, kurie padeda reglamentuoti bendrus teisinius santykius[3];

[3] Asmeniui, parašiusiam pirmojo studijų ciklo SS paskutiniąją SG2 dalį, reikia skirti kreditą, kaip šio sakinio bendraautoriui.

- Atlieka daug įvairių kitų techninių matavimų statybos pramonei, statybos procesams, deformacijos stebėsenai ir kt.;
- Vertina erdvinių duomenų kokybę duomenų teikimo kontekste, taip pat vertinant atitinkamus poreikius.

Profesionalų ir akademinės visuomenės iššūkis – nustatyti naujųjų technologijų potencialą (prietaisus, palydovus, kompiuterius, internetą ir kt.) profesionalioms sritims, demonstruoti, kaip jos pritaikomos visuomenės labui ir padėti naudoti naujas priemones bei praktikas.

Keletas šių geodezinių paslaugų, susijusių su geodezinių nuorodų sistemų palaikymu, rodo žemės paviršių didesnėse teritorijose ir todėl buvo nuolat naudojamos tarptautiniuose projektuose, todėl tam reikia palaikyti tarptautinį bendradarbiavimą. Tačiau, kalbant apie topografinės ir kadastrinės informacijos teikimą, manome, kad vis didėja poreikis jį koordinuoti bei standartizuoti tarptautiniu mastu, Europos kontekste ir labiau globaliniame kontekste.

Daugelis tarptautinių organizacijų turi tokių pačių siekių, pavyzdžiui, Tarptautinė geodezijos asociacija, Tarptautinė matininkų federacija (FIG), Tarptautinė fotogrametrijos ir nuotolinių tyrimų sąjunga (ISPRS), Tarptautinė kartografijos asociacija (ICA), Atvirasis geoerdvinis konsorciumas (OGC) ir kitos.

Vertėtų paminėti šias Europos organizacijas:

- Europos geografinės informacijos laboratorijų asociacija (AGILE);
- „EuroGeographics“ – Europos kadastrų, žemės registro ir nacionalinių kartografavimo įstaigų narių asociacija;
- „EuroSDR“ – Europos erdvinių duomenų tyrimo tinklas, jungiantis pirmiau minėtos „EuroGeographics“ asociacijos narius ir akademinę visuomenę, siekiant atlikti taikomuosius tyrimus teikiant, valdant ir pristatant erdvinius duomenis.
- EULIS – Europos nekilnojamojo turto informacinė tarnyba, ELRA – Europos žemės kadastrų asociacija ir Nuolatinis kadastro komitetas (NKK), kurie, kartu su „EuroGeographics“, parengė sutarties projektą dėl bendros Europos kadastrų ir nekilnojamojo turto registro organizacijų bendradarbiavimo vizijos.
- INSPIRE, kuri, vadovaudamasi INSPIRE direktyva ir įgyvendinimo priemonėmis, siekia sukurti Europos Sąjungos (ES) erdvinių duomenų infrastruktūrą;

- Jungtinių Tautų Europos ekonominės komisijos (JTEEK), be visų kitų parengė UNECE Gaires dėl nekilnojamojo turto administravimo.

Galiausiai, būtent judrumo programose dalyvaujantis personalas ir studentai gali gauti naudos iš modernaus FIG pristatomo kadastrinio modelio, INSPIRE esamos situacijos ataskaitos ir (jei prieinama) UNECE Nekilnojamojo turto administravimo apžvalgos ataskaitos tarpusavio palyginimo.

Vertinimo grupei padarė įspūdį Įsivertinimo suvestinėje gerai aprašytas studijų programos santykis su Lietuvos ir kitoms Europos visuomenėmis. Teigiama nuomonė apie studijų programą buvo vėliau pagrįsta diskutuojant, ypač apie programos vadybą. Pavyzdžiui, vadovybė, dėstytojai ir studentai atvirai ir konstruktyviai nurodė trūkumus.

1. ***Programos tikslai ir studijų rezultatai***

Studijų programą gerai vertina su KK gerus ir oficialius santykius palaikantys darbdaviai. Programos studijų rezultatai smulkiai aprašyti konkretaus studijų dalyko / modulio studijų rezultatuose.

2. ***Studijų turinio modelis***

Studijų turinys yra parengtas gerai. Reguliariai organizuojamuose susirinkimuose studijų turinys vis atnaujinamas. Personalas žino apie studijų krypties aspektus ir naująsias technologijas bei nuolat juos integruoja.

3. ***Dėstantis personalas***

Personalo kvalifikacija yra tinkama. Atskira diskusija apie privalumus ir trūkumus gali padėti pastebėti, kaip būtų galima optimaliai išnaudoti personalo gebėjimus. Katedra įdarbina savo absolventus.

4. ***Patalpos ir mokymosi ištekliai***

ES fondų lėšos buvo panaudotos studijų reikmėms naudojamiems įrengimams ir programinei įrangai gerinti. Apie patobulinimus taip pat diskutuojama su absolventus įdarbinančiomis bendrovėmis. Įrangą ir kitas priemones studentai įvertino teigiamai.

5. ***Studijų procesas ir studentų darbo vertinimas***

Studentai informavo vertinimo grupę, kad apskritai, jie yra patenkinti savo mokymosi procesu ir kad studentų santykiai su dėstytojais yra geri. Siekiant prisiderinti prie studijų krūvio ištęstinės studijos buvo pratęstos nuo 4 iki 4,5 metų. Aktyviai naudojama „Moodle“ sistema, per ją pateikiama apie 90 proc. studijų medžiagos. Studentų pašalinimo klausimas yra atidžiai sprendžiamas.

6. Programos vadyba

Visoje institucijoje vyrauja konstruktyvus-kritiškas požiūris į kokybės teikimą bei užtikrinimą, tai įrodo pateikta ĮS ir patvirtina su vadovybe, dėstytojais, studentais, buvusiais studentais ir darbdaviais organizuoti susitikimai. Pavyzdžiui, kiekvienas dėstytojas privalo pateikti planą ateinantiems metams, kuriame privalo būti tokie punktai: 1. Dėstymas, įskaitant pasiūlymus dėl naujo ar pakeisto studijų turinio, 2. Dalyvavimas moksliniuose tyrimuose ir konferencijose, ir 3. Paties dėstytojo profesinis tobulėjimas. Planas sudaro dėstytojo dabartinį įsivertinimą ir jį atitinkamai aptaria, keičia bei tvirtina Studijų programų komitetas ir katedra. Taigi dėstytojų ir vadovybės santykiai yra iš tiesų gerai organizuoti.

Ekspertų grupė teikia kai kurias specifines rekomendacijas:

- Matosi, kad Įsivertinimo suvestinėje pristatomi besikartojantys teiginiai apie koreguojamuosius veiksmus yra gerai peržiūrimi. Pavyzdžiui, viename punkte siūloma socialiniams dalininkams organizuoti seminarą apie kreditų sistemą ir studijų rezultatus. Toks veiksmas iš tiesų yra pagirtinas. Kai kalbama apie nacionalinę problemą, vertinimo grupė siūlo, kad kvietimai būtų siunčiami ne tik įprastam KK socialinių dalininkų ratui, bet platesniam.
- Naudinga lyginti studijų rezultatų aprašus tarptautiniu mastu. Vertinimo grupė siūlo KK tinklalapyje paskelbti Geodezijos studijų programos studijų rezultatus ir teikti dalines nuorodas į panašius aprašus, pvz., teikiamus Kanados profesionalių geodezininkų egzaminuotojų tarybos (CBEPS).

V. APIBENDRINAMASIS ĮVERTINIMAS

Kauno kolegijos studijų programa *Geodezija* (valstybinis kodas – 653H14003) vertinama teigiamai.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	4
2.	Programos sandara	4
3.	Personalas	4
4.	Materialieji ištekliai	4
5.	Studijų eiga ir jos vertinimas	4
6.	Programos vadyba	4
	Iš viso:	**24**

* 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)

Grupės vadovas:
Team Leader: Erik Stubkjaer

Grupės nariai:
Team members: Martien Molenaar

Mercedes Farjas

Andrius Jurelionis

Vytautas Urbonavičius

<...>