



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus universiteto
STUDIJŲ PROGRAMOS *METEOROLOGIJA IR HIDROLOGIJA*
(valstybinis kodas - 6121CX010, 612F83001)
VERTINIMO IŠVADOS

EVALUATION REPORT
OF *METEOROLOGY AND HYDROLOGY* (state code - 6121CX010,
***612F83001*) STUDY PROGRAMME**
at Vilnius University

Experts' team:

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2. **Prof. Andrew Cooper,** *academic,*
3. **Prof. Dr. Adam Weintrit,** *academic,*
4. **Dr. Christiane Weber,** *academic,*
5. **Mr. Sakalas Gorodeckis,** *social partner,*
6. **Mr. Dionyzas Šlimas,** *students' representative.*

Evaluation coordinator -

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Išvados parengtos anglų kalba
Report language – English

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Meteorologija ir hidrologija</i>
Valstybinis kodas	6121CX010, 612F83001
Studijų sritis	Fiziniai mokslai
Studijų kryptis	Gamtinė geografija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (4)
Studijų programos apimtis kreditais	240
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Fizinių mokslų bakalauras
Studijų programos įregistravimo data	23-04-1999 No. 560

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Meteorology and Hydrology</i>
State code	6121CX010, 612F83001
Study area	Physical sciences
Study field	Physical Geography
Type of the study programme	University Studies
Study cycle	First
Study mode (length in years)	Full-time (4)
Volume of the study programme in credits	240
Degree and (or) professional qualifications awarded	Bachelor in Physical sciences
Date of registration of the study programme	23-04-1999 No. 560

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I. INTRODUCTION

1.1. Background of the evaluation process

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

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

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

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

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

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

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

1.2. General

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

No.	Name of the document
1	Organisational structure of the Vilnius University
2	Performance indicators of the program staff (<i>h-index</i>)

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

Vilnius University (hereinafter also University or VU), founded in 1579, is the oldest and largest institution of higher education in Lithuania. As of 1st of January 2017, the University had 3627 employees (including 1377 teaching staff and 450 research staff) and had 20236 students

University comprises 23 core academic units: twelve faculties, seven institutes (with two of them of faculty status), four research and study centres and seven core non-academic units.

The FCHG (hereinafter also Faculty) was founded in November 14, 2016 after joining two former faculties: Faculty of Chemistry and Faculty of Geosciences. The Faculty operates in accordance with the Statute of Vilnius University. The Faculty comprises 2 institutes: Chemistry and Geosciences. Institute of Chemistry has 6 departments. Institute of Geosciences has 4 departments.

The Faculty implements 7 first cycle and 7 second cycle study programmes. The Faculty also implements doctoral studies in the field of Chemistry, 2 joint doctoral study programmes (Physical Geography and Geology with NRC and Klaipėda University).

The study programme of Meteorology and hydrology is implemented by the Department of Hydrology and Climatology in Institute of Geosciences. The programme has been implemented from 1995. Before 1995 undergraduate and graduate studies were combined in integrated studies (five years long study).

1.4. The Review Team

The review team was completed according *Description of experts' recruitment*, approved by order No. V-41 of Acting Director of the Centre for Quality Assessment in Higher Education. The Review Visit to HEI was conducted by the team on *24 October, 2017*.

- 1. Prof. Maris Klavins (team leader)**, *Professor of Department of Environmental Science, University of Latvia, Latvia;*
- 2. Prof. Andrew Cooper**, *Professor of Coastal studies, School of Environmental Sciences, University of Ulster, Ireland;*
- 3. Prof. Dr. Adam Weintrit**, *Professor of the Faculty of Navigation, Gdynia Maritime University, Poland;*
- 4. Dr. Christiane Weber**, *Senior researcher at CNRS DRCE, France;*
- 5. Mr. Sakalas Gorodeckis**, *board member of Geography and the Geographical Society, Lithuania.*
- 6. Mr. Dionyzas Šlimas**, *student of Kaunas University of Technology of Chemical engineering study programme.*

Evaluation coordinator – Miss Lina Malaiškaitė

II. PROGRAMME ANALYSIS

2.1. Programme aims and learning outcomes

The aim of the Vilnius university study programme Meteorology and hydrometeorology is to prepare graduate level meteorologists and hydrologists, trained to find employment after graduation of the study program and being able to continue studies at MSc level. The learning outcomes are achieved by studying physical processes in atmosphere, seas, rivers, lakes, wetlands as well as developing critical and analytical thinking, research and practical skills, to be able to analyze hydrosphere and atmosphere, their monitoring, hydrological and meteorological forecasting, climate and water resource management. The programme attracts many applicants, thus reflecting this demand for the programme graduates in the state labour market. The programme conforms with the University's objectives, its statutes and academic regulations. The programme purpose complies fully with state national legislation and considers international (EU) trends.

The programme's main stated aim is to prepare well qualified graduates competent to meet the requirements of the modern knowledge-based and information-based Lithuanian and EU economies. The programme aims comply with the requirements for the second level of university studies. In general, they are relevant to national needs in respect of developing research on integrated climate change, hydrology etc.

The range and complexity of the learning outcomes are appropriate for the study field and level of the programme. Achievement of the intended outcomes corresponds to the preparation of specialists in the physical sciences. The programme allows students to gain knowledge of physical processes in the environment, to develop skills in analyzing environmental problems, to improve their research skills and basic skills in research methods. The programme is interdisciplinary. Links between the subjects and their sequence, together with the infrastructure available for the running of the study programme, promote the achievement of the programme's aims and the understanding and attainment of the intended learning outcomes within the duration of studies. Already, more practical training has been offered since the programme's previous evaluation. The intended learning outcomes are consistent at both programme and subject levels.

The expert group strongly approved the careful and comprehensive identification and mapping of intended learning outcomes since the previous programme evaluation. It is clear that the learning outcomes have been considered for their appropriateness to the demands of the labour market and other professional and societal needs. The acquisition of practical and transferable skills has gained greater prominence. There was some interaction with external stakeholders in

the renewal process, but their involvement is not systematic, thus it would be important to regularly consult stakeholders to renew the learning outcomes.

2.2. Curriculum design

Generally the programme structure is in line with the Lithuanian legislative requirements and in the direction of meeting EU standards. Subjects of study (modules) are taught in a consistent manner, subjects and topics are not repeated. The content of subjects (modules) corresponds to the type and cycle of studies, starting from the basics in physical sciences, but including also study courses supporting development of generic skills and professional competences needed in the labour market. Expected learning outcomes are transparent and clearly reflect the programme content also they corresponds to requirements for Bachelor programmes in Physical Sciences. The content of subjects (modules) and study methods enable to achieve the intended learning outcomes: courses are arranged in a logic way. The scope of the programme is sufficient to achieve the learning outcomes. The content of the programme corresponds to the academic and technological achievements, however it should be considered rapid developments of technologies in climate, water research, monitoring technologies and applications of remote sensing methods. Thus regular renewal of the program curricula is essential and should be continued. A suggestion in this direction could be to put more stress on remote sensing applications and modelling of environmental and climate processes. The curriculum takes into account the requirements of the local labour market and covers a wide range of transferable skills that will increase the employability of the graduates also in field of environmental protection and others, but the limited national labour market could get fast saturated and thus also international perspectives, especially considering climate changes issues should be more addressed in the program. The curriculum looks like to be attractive for students, whose expectations are matched to the actuality and therefore motivated to pursue their studies.

2.3. Teaching staff

This program is taught by a large number of staff (27) with between 4 and 34 years teaching experience. All are professors, Associate professors or lecturers and all have PhDs. They are suitably qualified in the various field of meteorology, hydrology and ancillary subjects. The staff complement meets the legal requirements. Staff are well qualified to deliver the varied learning outcomes.

There is a moderate level of research activity among the teaching staff that is reflected in the quality and levels of publications. Most staff have H indices below 5. One is above 10. Some

have published predominantly in national journals while some have international publications. A university five-yearly staff review provides a stimulus for staff to perform in research. University financial incentives for certain publications also provides motivation. Some staff teaching introductory subjects (e.g. physics, English) undertake research in fields outside the subject matter of this course. The level of participation in internships and study visits nationally and abroad is quite variable and there is only a moderate level of recent activity. The University provides support for such visits *via* the Erasmus programme and its own initiatives. It also puts on internal training events on pedagogy and English which several staff have attended. Students viewed some staff as highly competent and knowledgeable in their subject, and others less so. Alumni were pleased with the staff that taught them.

Joint research with foreign researchers also provides exposure to research developments for staff and students. Occasional lectures are provided by visiting foreign scientists.

Recent reorganisation of the faculty has united the geography staff with chemistry staff. This offers new possibilities for research collaboration and modifications to the programme. Staff success in research projects has allowed the purchase of a range of expensive equipment that enhances teaching in meteorology and hydrology.

Staff expertise is acknowledged by social partners who occasionally call upon their expertise for projects. Social partners are willing to contribute to the teaching programme as suggested in section 6.6 of the SER.

2.4. Facilities and learning resources

The BSc program is managed by a year ago reorganised the Faculty of Chemistry and Geosciences, which consists from two Institutes. One of them the Institute of Geosciences occupies a part of one 3 story historic building in the Vilnius University camp at the Čiurlionio street area. This Institute located at this building has five departments. The owner of BSc programme is the Department of Hidrology and Climatology, which recently has physical resources for the studies. The auditoriums and classes using for this programme are renovated and equipped by modern multimedia.

At the Faculty are few computers classes available for students, whose could use own laptops as well. The up-to-dated licensing of computers software including designed for specific climatology data processing and GIS purposes is maintained. Most lectures and practical classes

are held in the Faculty building. The laboratory equipment is adequate for studies at the bachelor level. In general, the premises for studies are sure adequate in both size and quality.

The automatic training meteorological station is set up in the Geosciences institute backyard and is providing data online for researchers as well as for students. For field works are using modern mobile weather stations, remote sensing equipment and hydrological devices for river runoff measurements. Department has renovated and maintained with modern equipment internship centre. The arrangements for students' practice are good.

The literature for the courses is mainly in the Lithuanian language, with some basic textbooks in English. Recently the library holds almost all of the subject literature and most of the general science literature used in the programme. The students have possibility to use other modern organised University libraries as well.

2.5. Study process and students' performance assessment

Admission requirements are nationally specified and centrally administered by the University. The dropout rate is of concern, albeit that many of the reasons for leaving the programme are personal and beyond the remedial abilities of the programme managers. A major contributing cause is that the programme does not match the students' prior expectations. Knowledge of mathematics and other sciences is often inadequate, the points score formula for school leavers allowing students with poor performances in those subjects nevertheless to qualify for entry.

The organization of the study process ensures an adequate provision of the programme and the achievement of the learning outcomes. Classes are evenly distributed during a week and over a semester. They are well balanced between lectures, seminars, and practical sessions. The organising task, performed by the Department, is considerable; it is a notable feat to be able to ensure an adequate provision of the programme and the achievement of intended learning outcomes. Students are provided with all necessary information about classes, aims and outcomes, subject requirements and the scheduling of assessments, learning practices and study papers, including the final thesis. The information is provided in a variety of ways and in a timely fashion. The main information source is the website. The students who met with the expert group mentioned they would like to get feedback from teaching staff after module evaluations.

Students carry out research as a compulsory part of the programme. They are also encouraged to participate in scientific work or projects, but unfortunately not in direct ways. Many students are members of the very active Student Scientific Society of Natural Sciences. It organises seminars, debates, competitions, expeditions; shows self-produced documentaries and popular science films; and organises scientific sightseeing tours. The Society helps its members to deepen their knowledge in courses, seminars, conferences and preparing research papers; it also arranges students' interviews, develops academic links with schools and creates a network of young scientists. The Faculty organises a wide range of events for students to be able to meet and interact with teachers and social partners; some of the events also involve staff from other universities, in Lithuania and abroad, and graduates from the programme. All these activities heighten students' motivation and help to promote the excellent relations between staff.

The University provides financial support by scholarships, but the number of them is not high. University provides the social support of students with disabilities or other handicaps to study, such as serious illness or bereavement. Counselling and advisory services are available to help and guide students experiencing study difficulties.

Students have opportunities to participate in the ERASMUS exchange (student mobility) programme. Students expressed that the information they get is limited and they are not encouraged to participate. At bachelor level this is limited to students with good results and facility in a foreign language; they can spend six months at a chosen West European university.

The assessment of knowledge and achievement is by a variety of continuous, intermediate and final examination methods. They take mostly traditional written forms. University regulations govern eligibility to take a subject examination and if necessary retake it. Study subject documentation informs students about the assessment methods to be used. The assessment system appears to be well organised and equitable; it is clear, adequate and publicly available. Specific procedures govern the preparation and submission of the final thesis. Students are well supervised by their teachers. The supervision system, involving close contact between supervisor and student, would appear to be a formative one.

The main employers of graduates from the programme are divisions of the Lithuanian Ministry of Environment, especially the Hydrometeorology service. On average the service recruits four or five graduates each year. This would appear to be a stable demand. Other employers whose activities include weather and water monitoring and climate change take a few graduates every

year; their demands would appear to be increasing. Graduates seem to have the training and general skills to gain employment in the modern graduate labour market. Employers and graduates all expressed appreciation of the knowledge and skills that students acquired during the programme. Hence, the professional activities of the majority of graduates meet the programme providers' expectations.

2.6. Programme management

The responsibilities for decisions and monitoring of the implementation of the programme need to be more precise. The reorganization of the department and faculty structure will certainly help to the clarification. The gathering of geosciences and chemistry due to the Strategic plan of University must be considered as an opportunity to ease the emergence of new teams and new ideas. The sharing of instrumental facilities will also bring new possibilities in various experimental domains. A peculiar attention is needed to assure the sustainability of the equipment and the facilities, providing necessary technical support and maintenance.

Regular meetings allow to follow up the performance of the SP and get information about the implementation of the SP. Various topics might discussed especially the available instruments.

Regular outcomes of internal evaluations are used to improve the SP, the students are asked to fill the quality assessment and also personal teacher questionnaire. Feedback is visible in the lectures or the practical field trip. However it seems that direct feedback is not provided to the students. A better way to interact might be necessary in order to provide better information to students.

The stakeholders and partners are fully integrated in the SP implementation and dynamic. The bachelor final thesis might be proposed and specified by the teacher and a representative of a social partner. Social partners are also present in the defending process. The attractiveness of the SP is developed through numerous tools: numerical (web, broadcast communication, social media); networking (alumni network)

III. RECOMMENDATIONS*

1. Direction towards internationalisation of the study program can be strongly recommended. The activities to reach study program internationalisation aims might include regular delivery of lectures (seminars etc.) in English language, delivery of a part of the study program in English language, regular improvement of the study program staff performance in English
2. Review the formulation of expected learning outcomes so that they clearly reflect the programme content and ensure the distinctiveness of the Bachelor and Master programmes in Physical Sciences is transparent.
3. Continue to review the curriculum so as to follow trends in the labour market and incorporate an overt range of transferable skills that will enhance the employability of graduates from the programme.
4. Continue to improve the learning resources, particularly with regard to projected investments in the physical infrastructure, and extend the investments to include library resources, especially academic books, monographs, course textbooks and key texts in the English language.

IV. SUMMARY

The aim of the study programme is to prepare graduate level meteorologists and hydrologists, trained to find employment after graduation of the study program and being able to continue studies at MSc level. The learning outcomes are achieved by studying physical processes in atmosphere, seas, rivers, lakes, wetlands as well as developing critical and analytical thinking, research and practical skills, to be able to analyze hydrosphere and atmosphere, their monitoring, hydrological and meteorological forecasting, climate and water resource management. The programme attracts many applicants. The programme aims comply with the requirements for the second level of university studies. The range and complexity of the learning outcomes are appropriate for the study field and level of the programme. The programme allows students to gain knowledge of physical processes in the environment, to develop skills in analyzing environmental problems, to improve their research skills and basic skills in research methods. The programme is interdisciplinary. The content of the programme corresponds to the latest academic and technological achievements. The curriculum takes into account the trends in the labour market and covers a wide range of transferable skills that will increase the employability of the graduates. The curriculum looks like to be attractive for students, whose expectations are matched to the actuality and therefore motivated to pursue their studies.

There is a moderate level of research activity among the teaching staff that is reflected in the quality and levels of publications. Recent reorganisation of the faculty has united the geography staff with chemistry staff. This offers new possibilities for research collaboration and modifications to the programme. The stakeholders and partners are fully integrated in the SP implementation and dynamic.

V. GENERAL ASSESSMENT

The study programme *Meteorology and Hydrology* (state code - 6121CX010, 612F83001) at Vilnius University is given **positive** evaluation.

Study programme assessment in points by evaluation areas.

No.	Evaluation Area	Evaluation of an area in points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	3
3.	Teaching staff	3
4.	Facilities and learning resources	4
5.	Study process and students' performance assessment	3
6.	Programme management	3
	Total:	19

*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. Maris Klavins
Grupės nariai: Team members:	Prof. Andrew Cooper
	Prof. Dr. Adam Weinrit
	Dr. Christiane Weber
	Mr. Sakalas Gorodeckis
	Mr. Dionyzas Šlimas