



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus universiteto  
**STUDIJŲ PROGRAMOS *HIDROMETEOROLOGIJA* (valstybinis  
kodas - 6211CX012, 621F83001)  
VERTINIMO IŠVADOS**

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**EVALUATION REPORT  
OF *HYDROMETEOROLOGY* (state code - 6211CX012, 621F83001)  
STUDY PROGRAMME  
at Vilnius University**

**Experts' team:**

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5. **Mr. Sakalas Gorodeckis,** *social partner,*
6. **Mr. Dionyzas Šlimas,** *students' representative.*

**Evaluation coordinator -**

***Miss Lina Malaiškaitė***

Išvados parengtos anglų kalba  
Report language – English

## DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Hidrometeorologija</i>
Valstybinis kodas	6211CX012, 621F83001
Studijų sritis	Fiziniai mokslai
Studijų kryptis	Gamtinė geografija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Antroji
Studijų forma (trukmė metais)	Nuolatinė (2)
Studijų programos apimtis kreditais	120
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Fizinių mokslų magistras
Studijų programos įregistravimo data	19–05–1997 No. 565

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## INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Hydrometeorology</i>
State code	6211CX012, 621F83001
Study area	Physical sciences
Study field	Physical Geography
Type of the study programme	University Studies
Study cycle	Second
Study mode (length in years)	Full-time (2)
Volume of the study programme in credits	120
Degree and (or) professional qualifications awarded	Master in Physical sciences
Date of registration of the study programme	19–05–1997 No. 565

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The Centre for Quality Assessment in Higher Education

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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 The

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 Hydrometeorology is implemented by the Department of Hydrology and Climatology in Institute of Geosciences. The programme has been implemented in 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 Hydrometeorology is to prepare hydrometeorologists who can do scientific and practical research using modern technology, involve themselves successfully into local and international projects and continue their studies in doctoral programme. The aims and learning outcomes of the study program are formulated in compliance with the “Tuning” methodology. The labour market of graduates includes knowledge and skills necessary to be able to work in scientific and academic institutions, institutions of the Ministry of Environment of the Republic of Lithuania, private companies as well as continue to study at PhD level. The learning outcomes of the study program are well defined in the program self-evaluation report, they are public available. The programme aims and learning outcomes (as stated in the SER) are based on the academic and professional requirements, public needs and the needs of the labour market and they are consistent with the MSc level of qualification in physical sciences. The revision of the learning outcomes and their renewal is well structured, involves active participation of social partners and considers professional requirements common for physical science students. The program is very much oriented towards needs of local hydromet services as well as business. Thus the program is directly addressing national needs in respect to university graduates. At elaboration of learning outcomes at first needs in Lithuanian labour market is considered as well as continuity with the preceding BSc study program. However the content of the study program would benefit from comparison with the content, learning outcomes of similar study programs in EU as well as elsewhere.

Study courses supporting the development of generic skills and entrepreneurship also are considered for the future development of the study program. The site visit to VU provided additional evidence that the participating students, faculty, administration and contributing social partners were all supportive of these aims and their actions were consistent with the program. Furthermore, the curriculum and resulting thesis provide strong evidence as to the focus and strength of the program. The outcomes of the program were supported by student surveys of the program and by a strong need for this program by the social partners. Certainly, the current learning outcomes need to be continuously monitored and benchmark against other similar study programs both in Lithuania (at Klaipeda University) and more important, internationally.

### ***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 and largely based on the VU Geography study program curricula. However this might pose problems for students from other study programs and universities. The problem is serious as the majority of students who are leaving the studies during the first semester; they are mainly students who have graduated in a bachelor programme other than hydrology and meteorology and who find the programme different and more difficult than they expected. Students expressed that study program could be more concentrated and shorter. Student opinions should be considered at constructing the curricula. Considering the significance of the climate change issue interdisciplinary it could be suggested more attention in the study program curricula to pay to climate change politics, mitigation, adaptation etc. aspects.

The goals and outcomes of the program and the curriculum include taking into account basic research skills and acquiring basic skills and promoting the development of a scientific mentality. The programme of the study field's covers latest international achievements in science and technology, both considering monitoring methods, both data treatments. The content of subjects (modules) corresponds to the type and cycle of studies. Expected learning outcomes are transparent and clearly reflect the programme content and ensure the distinctiveness of the Bachelor and Master programmes in Physical Sciences.

The content of subjects (modules) and study methods enable to achieve the intended learning outcomes as is evident from SER. The scope of the programme is sufficient to achieve the learning outcomes. 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 takes into consideration students placements (internships) to the programme to enhance students' motivation and strengthen their platform for entering employment.

### ***2.3. Teaching staff***

This program is taught by an appropriate number of staff who are suitably qualified in the various field of hydrometeorology. Many have previous direct experience in practical aspects of hydrometeorology that must enhance the teaching experience. The staff complement meets the legal requirements. There is a good mix of experience among staff and they each have between 5 and 27 years teaching experience. Staff are well qualified to deliver the varied learning outcomes: staff covers not only specialists from hydromet background, but also IT, GIS and others.

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 as it was explained during meeting with the program administration. 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, but their number is rather small.

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 MSc 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 MSc programme is the Department of Hidrology and Climatology. Most lectures and practical classes are held in the faculty building, 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. In general, the premises for studies are adequate in both size and quality.

The automatic training meteorological station is set up in the Geoscience Institute backyard and is providing data for individual master research projects. For field works are using modern mobile weather stations, remote sensing equipment and it is used in study process, for elaboration of thesis works. The studies researches could be developed with the equipment and data provided by social partners, e.g. Lithuanian Hydrometeorological Service. The arrangements for students' practice are good as stated graduates.

The literature for the courses is mainly in the Lithuanian language, the programme's principal language. Due the reorganisation the faculty library located in the same building is splitted, focusing recently for the Institute of Geosciens purpose only. So the Institute library renovation and modernization is planned for the end of 2017. The University library subscribes to full-text databases, where students can really find the information needed for their studies and research. But there is shortage of learning resources, which is partially compensated by bought publications in other languages. Part of specific literature available for students is provided by lectors from deparment collections. The students have possibility to use other modern organised university libraries as well. In generally, the having teaching materials are covering programme needs, howver more materials could be put on the Moodle platform.

### ***2.5. Study process and students' performance assessment***

Admission requirements are centrally specified administered by the University. A bachelor degree in a wide range of geography, geology and environmental science study fields is a basic requirement. Thereafter performance in first-degree studies is the main contributor to the accumulation of a competitive points score that students may use in applications. Most applicants are from the University and most admissions are from the bachelor programme in Meteorology and Hydrology. Some students do re-enrol, completing their studies in three rather than two years.

The organisation of the study process ensures an adequate provision of the programme and the achievement of the learning outcomes. Classroom activities are evenly distributed during a week and over a semester. They are well balanced between lectures, seminars, and practical sessions. As far as possible they are timed to accommodate the majority of students who are also in employment.

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 acknowledged they are kept well informed and are content that what is delivered in the programme is what the information leads them to expect.

Students carry out research as a large compulsory part of the programme. They are also encouraged to participate both in scientific activities outside the programme and in social activities. A few students mentioned that they are able to work with staff members on their research projects. 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 and students that greatly impressed the expert team. They lie at the heart of the academic and social support the Department provides.

The University provides financial support in a number of ways. Scholarships reward certain academic successes or are directed to 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 but are not encouraged. The students who met with the expert team expressed interest in the ERASMUS programme but claimed to have been unsuccessful applicants.

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. Most of the staff in the Service are graduates from the programme. In recent years the Service has taken two to four graduates from the programme and, in total, the Ministry of Environment has taken seven or eight. This would appear to be a stable demand. Many graduates hold leading scientific or managerial positions in the Ministry's various divisions. 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 clearly define. 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 like in soils science for instance.

Regular meetings allow to follow up the performance of the study program and get information about the implementation of it (see SER). Topics are discussed during the meetings especially about the available instruments or field campaigns to set up. Additionally, continuous feedback between student and teacher is used formatively, to improve student performance and modify the teaching.

A peculiar attention is needed to assure the sustainability of the equipment and the facilities. As the equipment is generally funded with research projects supports, it is often difficult to consider that is it also a pedagogical investment. Consequently in order to manage such costly equipment is it mandatory to find a way to continue to maintain it.

The SAR, however, indicates that there are situations where employment responsibilities have not harmonised with the programme schedule and students have left the programme. This would suggest that teaching staff and study program could become more flexible.

The outcomes of internal evaluations are used to improve the SP, the students are asked to fill the quality assessment and also personal teacher questionnaire. Feedbacks are done in the lectures content 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. Dropout rate is of some concern, albeit that many of the reasons for leaving the programme are personal and beyond the remedial abilities of the programme managers.

The stakeholders and partners are fully integrated in the MA SP implementation and dynamic. The expert team during the meeting with the stakeholders has been convinced that they are quite satisfied by the knowledge provided and the sound bases get by the students. They participated to the definition of the master final thesis, proposed and specified by the teacher and a representative of a social partner. Social partners as such are also present in the defending process.

But stakeholders expected also from the SP the capacities to wider the competences of the students on more general question, more integrative capacities to handle the complexity of actual issues (Global change, regulation requirements etc.). They also suggest that actual technological capacities trends will be follow up in the MA SP in computer programing and modelling.

### **III. RECOMMENDATIONS\***

1. It is recommended to allocate more time for practical training, internships supporting professional orientation and competitiveness in labour market.
2. A significant resource for the program development and improvements in it could be considered graduates (alumni) and social partners and thus it can be suggested to strengthen cooperation with alumni and establish it on regular basis. Also involvement of social partners at the improvement of study program can significantly contribute at the further development of the study program.
3. 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.
4. Review the curriculum to enhance the representation in the programme of the study field's latest international achievements in science and technology.

#### **IV. SUMMARY**

The aim of the Hydrometeorology master study program is to prepare hydrometeorologists who can do scientific and practical research using modern technology, involve themselves successfully into local and international projects and continue their studies in doctoral programme. The program content is regularly updated considering recent trends in situation in labour market as well as academic environment. Close cooperation with social partners, employers is significantly contributing at the renewal of the study program content. During recent time significant improvement of the research and study infrastructure has happened. Also the research performance of the teaching staff can be appreciated.

The efforts of the study program management to attract students can be considered as efficient. The visibility of the academic staff in Lithuanian society through their strong relationships with stakeholders is a factor attracting students. To improve the competitiveness of graduates in the labour market further improvement of English language skills of students could be important, delivering at least some lectures in English language. It could be suggested more time to allocate for practical training, internships.

Considering the significance of the climate change issue interdisciplinary it could be suggested more attention in the study program curricula to pay to climate change politics, mitigation, adaptation etc. aspects.

## V. GENERAL ASSESSMENT

The study programme *Hydrometeorology* (state code - 6211CX012, 621F83001) at Vilnius University is given **positive** evaluation.

*Study programme assessment in points by evaluation areas.*

<b>No.</b>	<b>Evaluation Area</b>	<b>Evaluation of an area in points*</b>
1.	Programme aims and learning outcomes	3
2.	Curriculum design	3
3.	Teaching staff	3
4.	Facilities and learning resources	3
5.	Study process and students' performance assessment	3
6.	Programme management	3
	<b>Total:</b>	<b>18</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:	<b>Prof. Maris Klavins</b>
Grupės nariai: Team members:	<b>Prof. Andrew Cooper</b>
	<b>Prof. Dr. Adam Weinrit</b>
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