



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus universiteto

***APLINKOS HIDROGEOLOGIJOS IR GEOINŽINERIJOS
PROGRAMOS (612F77001)***

VERTINIMO IŠVADOS

**EVALUATION REPORT
OF *ENVIRONMENTAL HYDROLOGEOLOGY AND
GEOENGINEERING (612F77001)***

STUDY PROGRAMME

at Vilnius University

Grupės vadovas:
Team Leader: Prof. David Eastwood

Grupės nariai:
Team members: Prof. Alvar Soesoo
Prof. Valdis Seglins
Dr. Gražina Skridlaitė
Andrius Platakis

Išvados parengtos anglų kalba
Report language - English

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Aplinkos hidrogeologija ir geoinžinerija</i>
Valstybinis kodas	612F77001
Studijų sritis	Fiziniai mokslai
Studijų kryptis	Aplinkotyra
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (4)
Studijų programos apimtis kreditais	240 ECTS
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Geoaplinkotyros bakalauras
Studijų programos įregistravimo data	01 09 1997

INFORMATION ON ASSESSED STUDY PROGRAMME

Name of the study programme	<i>Environmental Hydrogeology and Geoengineering</i>
State code	612F77001
Study area	Physical sciences
Study field	Environmental Sciences
Kind of the study programme	University studies
Level of studies	First cycle
Study mode (length in years)	Full-time (4)
Volume of the study programme in credits	240 ECTS
Degree and (or) professional qualifications awarded	Bachelor of Geo-environmental Sciences
Date of registration of the study	01 09 1997

CONTENTS

CONTENTS.....	3
I. INTRODUCTION.....	4
II. PROGRAMME ANALYSIS	4
1. Programme aims and learning outcomes	4
2. Curriculum design.....	5
3. Staff.....	6
4. Facilities and learning resources.....	7
5. Study process and student assessment	8
6. Programme management	9
III. RECOMMENDATIONS	10

I. INTRODUCTION

The external assessment of the study programme was initiated by the Centre for Quality Assessment in Higher Education of Lithuania nominating the external assessment expert group formed by Professor David Eastwood (University of Ulster, Ireland - team leader), Professor Alvar Soesoo (Tallinn University of Technology, Estonia), Professor Valdis Seglins (University of Latvia, Latvia), Dr. Gražina Skridlaitė (Vilnius Gediminas Technical University, Lithuania) and student representative Mr. Andrius Platakis (Vilnius Gediminas Technical University, Lithuania).

The evaluation of the study programme made use of the following documents: Assessment of External Study Programmes: Methodological Guidelines for Experts; Regulations for Undergraduate, Specialised Professional and Integrated Study Programmes; Description of General Requirements for Bachelor's Study Programmes; Description of Study Programme Accreditation Order.

The basis for the evaluation of the study programme (hereafter, the programme) is the Self-Assessment Report (SAR), written in 2011, its annexes and the site visit of the expert group to Vilnius University (hereafter, the University) on November, 8-9 2011. The visit incorporated all required meetings with different groups: the administrative staff of the Faculty of Natural Science, staff responsible for preparing the self-assessment documents, teaching staff, students of all years of study, graduates, and employers. The expert group inspected various support services (classrooms, laboratories, library, computer facilities), examined students' final works, and various other materials.

After discussions and preparations of conclusions and remarks, the expert group presented introductory general conclusions of the visit to the self-assessment team. After the visit, the group met to discuss and agree the content of the report, which represents the members' consensual views. A significant amount of this report duplicates that of the review team's report on the Vilnius B.Sc. Geology programme but, given that the first two years of both programmes are virtually identical, this is inevitable. It also means that this report should be read in conjunction with the overview report on Geology provision at Vilnius University submitted by the review team.

II. PROGRAMME ANALYSIS

1. Programme aims and learning outcomes

As described in the Self-Assessment Report, the programme target is to implement the acquired knowledge, abilities, and skills in the field of research of geo-environment and its inter-action with human engineering industrial activity. This view was confirmed by employers when interviewed by the review team.

However, demand for the programme amongst school-leavers is relatively modest and the intake figures for the last five years have varied only between 8 and 15 entrants. At the same time, the number of fourth year students enrolled is higher, being in between 13 and 17 for the last five years. The increase of the senior students' number is connected with the fact that a part of students, who left the university and started working for various companies, later begin to understand the necessity of obtaining more knowledge and skills in hydrogeology and geo-engineering as well as better carrier opportunities. The reasons for the low entry figures are varied – absence of geology teaching in schools, higher than average admission

requirements, limited programme marketing and advertising of employment opportunities – but are also concerning, especially as this is the only study programme in hydrogeology and engineering geology in Lithuania; an issue dealt with in greater detail in the overview of first and second cycle geology provision at Vilnius University (VU) which accompanies this report.

The programme's major aim is clear and reasonable, as are the details of the development of student skills which accompany it. The breadth of the skills range outlined in the SAR is to be welcomed and, following the review visit, can be largely confirmed in practise, although much greater emphasis is necessary on the teaching of transferable skills (see section 2 below). The aims of the programme also correspond to the requirements of institutional, state and international requirements. Details of the programme are obtainable on the VU Website, but are not widely advertised beyond this. As stated in SAR, “the program directly meets the core targets of the Vilnius University – to enhance the science role and influence in the Lithuanian existing and future society, prepare highly qualified specialists, who are open to novelties and challenges of the continuously changing environment”.

According to the SAR, the main objectives of the programme are “to prepare qualified professionals in environmental hydrogeology and geo-engineering, who understand interaction between human activity and geo-environment, are capable of making prognosis of the outcome of industrial impact, make required decisions, are characterized by high erudition, creative and critical thinking, and are capable of improving and maintaining professional competence”.

The current high level of practical fieldwork (including short field practises), including foreign fieldwork, is especially commendable as it forms an essential component of necessary geological and geo-engineering studies. The programme learning outcomes are consistent with the type and level of studies and the level of qualification offered. The programme provides a sound first cycle qualification in general geology, hydrogeology and geo-engineering. The learning outcomes, content and qualifications offered are all fully compatible with this programme.

Main strengths and weaknesses

This is a sound first cycle programme in hydrogeology and geo-engineering with emphases on the environmental side. The learning outcomes are quite broadly based and are in line with both, academic and recent employment demands. However, it is necessary to put much greater emphasis on the teaching of transferable skills. The limited entry numbers, especially in recent years, give cause for real concern (see overview report).

2. Curriculum design

The programme meets Ministry of Science and Education legal requirements (ISAK 1158, 159, 1127, V-501) and general university requirements covering credits and obligatory and optional study fields in general education, basic subject knowledge and specialised professional education.

The curriculum design is broadly based and with satisfactory progression and sequencing, commencing with general university education, followed by basic subjects of progressive complexity and leading to the gradual introduction of specialised professional education subjects. As such, the curriculum design largely supports the achievement of the learning outcomes.

The curriculum is dynamic, rather than static with a significant number of changes introduced by the Programme Committee since 2007, including the change of the programme name in 2008. Nonetheless, students noted, and the review team concurs, that several

courses/modules, such as Principles of Evolutionary Theory and Quaternary Geology and Geomorphology are now badly dated and have changed little over a long period of time in either content, delivery or materials support (especially non-Russian textbooks/handbooks).

The curriculum is strong in the emphasis it places on field courses and practical training (not less than 40 ECTS). Generally, practical's and laboratory workshops cover ~ 25% of study hours. Despite the obvious financial strain imposed field courses, it is strongly recommended that they be continued and with the problems associated with annual, rather than at least bi-annual funding, being considered.

The curriculum design of a final year bachelor's thesis is sound in theory, but appears to be variably implemented in practice, with final theses at times disappointing, especially in terms of their superficiality and as noted by employers, poor literacy.

Main strengths and weaknesses

The curriculum is broadly based, progressive and consistent with the type and level of the studies. The emphasis on practical field courses in Lithuania and abroad is especially laudable. Weaknesses centre on some badly outdated teaching and reference materials and final thesis issues such as thesis content superficiality and, in some cases, poor literacy as noted by employers.

3. Staff

Programme staff is well qualified and experienced in the study field. The majority of programme staff are full-time and are supplemented by staff from other VU Departments and Chairs, e.g. Chemistry, Physics, Mathematics, Philosophy, Chair of Geography and Regional Study, Chair of Hydrology and Meteorology etc., and State institutions related to geology, e.g. the Lithuanian Geological Survey, the Nature Research Centre. In total, 42 teaching staff is involved in the programme, including 11 professors or associated professors. Given current student entry numbers, this clearly produces a very low (and potentially unsustainably low) staff to student ratio.

Other than staff from other faculties or State institutions, the turnover of programme staff is moderate to low. However replacement posts have a tendency to be filled not by new young staff, but by the appointment of admittedly more experienced, but more elderly candidates. This limits the programme staff's age profile and possibly limits teaching innovation. As the academic staff profile shows that only 34% of staff is younger than 40, it shows worrying signs.

Research activity amongst the staff is generally low, (although in some instances good), which leads to somewhat low publication records, especially at the international level.

Staff mobility is low to moderate, and showing worrying signs of decline with fewer staff travelling abroad, even for short periods, than five years ago. Teaching loads (which do not accord well with the relatively high staff numbers) and lack of finance were blamed for this by staff interviewed by the review team. However, there seemed to be little appetite to engage in established programmes, such as Erasmus staff exchange, or in producing competitive research applications to generate necessary funding. No foreign academics have taught recently on the programme. No staff interviewed had taken up their 'after five years' service legal right to sabbatical time.

Staff development activity is worryingly low, especially in terms of teaching skills. No staff interviewed by the review team had participated in any teaching skills courses organised either by the Department or the university and interest in developing teaching skills appeared to be negligible, with staff apparently unaware of the demands of a shift from teacher driven

provision to student centred learning. There is no system of peer evaluation of teaching, nor of annual staff evaluations.

Main strengths and weaknesses

Staff is qualified and available in sufficient numbers to teach the programme. A number of staff are research active at the national level, some at international level, but overall publication records are modest and are low at the international level. Staff mobility is very limited and is especially limited at the international level. Staff development of teaching skills is virtually non-existent. There is no system of peer evaluation of teaching, nor of annual staff evaluations. There is a need to address the polarised age structure of the teaching team in order to bridge knowledge transfer and collegiate gaps. The high staff to student ratio is a cause for significant concern.

4. Facilities and learning resources

Faculty physical provision for the programme is adequate, although some of the lecture rooms and especially laboratories are in need of refurbishment – a process which is currently underway using EU structural funding.

Although improving, teaching and learning equipment remains restricted, with both staff and students emphasising the lack of laboratory equipment and with ‘the need for additional equipment’ topping the list of priorities for both teaching staff and students - including insufficient provisions of petrological microscopes and limited resources of soft materials/samples/consumables which restrict individual, as opposed to group, laboratory practicals.

The programme is well supported by geological collections of minerals, fossils, rock collections etc. at laboratory, lecture room and departmental museum levels. Laboratories for engineering suffer from old, outdated equipment; however, there seems to be enough space for basic laboratory courses. ICP spectrometer equipment is in the installation phase.

For the courses of practical training, a set of research equipment is available under the agreement with the social partner UAB “Geotestus” (e.g. “Geotech” drilling machine with computerised CPT and DP devices, Geonor Vane Test soil strength test equipment, LDP light dynamic penetrometre, LGI oblique shearing machine, etc) There is a field training base at Kairėnai Botanic Garden. Some other sources of equipment outside the Faculty are available to students on a collaborative basis.

Library provision is adequate, and is relatively good with respect to electronic sources and databases. However, the review team supports students complaints of an absence of sufficient handbook source material both in Lithuanian and English and of an overprovision in Russian. IT resources are basic, but adequate for the programme and are showing steady improvement.

Main strengths and weaknesses

Despite the fact that teaching and learning equipment is steadily improving with funding from a number of sources and, in some areas, such as e-journals and e-databases, resourcing for the programme is now good, overall teaching and learning equipment remains clearly limited and a source of frustration amongst both staff and students.

5. Study process and student assessment

The admission requirements for the programme are LAMA BPO centralised and are well-founded. However, the high science entry grades are probably a significant factor in the modest levels of recruitment and are worthy of review.

The study process and course/module information is freely available on the university website, and the organisation of the study process ensures adequate provision of the programme and the achievement of the learning outcomes. However, first year drop out rates are a cause for concern and, despite the fact that part of these reflect inevitable personal and financial constraints, nonetheless the suspicion remains that some students either misunderstand what the programme entails, or fail to be motivated by it.

Assessment of students through essays, practicals, examinations and final thesis are varied, timely and the quantities of assessment are broadly appropriate to the programme. Assessment feedback appears to be very variable with wide variations between courses. Moreover, feedback seems to be always retrospective, with the student only becoming aware of problems/potential improvements after the event. Unfortunately all assessment also appears to be summative (i.e. marked and graded) with nil formative assessment (i.e. not graded and used more flexibly to train and develop skills and techniques). Under the current system it is difficult to see how a student has the opportunity to practise and develop transferable skill techniques such as writing, analytical or advocacy skills. This issue was raised by employers during the visit who expressed their concern, for example, at the low level of literacy and presentational skills of graduates. Similarly, the very moderate quality of final theses clearly reflects a lack of any rigorous formative training in how to write and present theses.

Fieldwork and field training forms a vital component of the programme and, despite the fact that students interviewed during the visit expressed their wish for more fieldwork, the current amounts of fieldwork are certainly adequate for the programme.

The process by which students supplement the programme by internship/placement work with State bodies and private companies is to be applauded, but seems to be currently variable, with students apparently having to find these placements themselves. This process should be formalised and regulated within the Department. Clearly, as employers confirmed, these internships/placements are extremely beneficial to employment prospects and often lead directly to employment itself. There was no mention by students of participation in either internal or external research, or applied research projects.

Opportunities exist for students to participate in student mobility programmes but the take up levels are low. Personal financial constraints play a clear role in this, but there is also a lack of clear information on available opportunities and the range of potential funding opportunities currently available. Such an information service would be extremely useful, especially if operating at a Faculty or Departmental level.

Although there is informal support, and teaching staff appear to be readily available, there appears to be no formal academic or social support system; for example no personal adviser for academic studies or for pastoral care. Given the worrying early first year drop-out rates on the programme, the introduction of such a personalised system certainly merits serious consideration.

Average final grades on the programme are good and employment prospects emanating from the programme are high in both the public and private sectors. Employers would certainly welcome and support a higher intake onto the programme.

Main strengths and weaknesses

The main strengths of the study process are a generally available and helpful staff and the emphasis placed on practical fieldwork and laboratory work. Assessment methods are reasonable with a varied composition of written and oral assessment in a variety of formats. However, the principal weakness of the assessment system lies in the absence of formative assessment and its concomitant effect on inadequate training in transferable techniques and skills. Other weaknesses involve the absence of formal information systems to deal with student mobility, internship/placement work, and personalised academic advice and pastoral care.

6. Programme management

Responsibilities for programme management is clear at University, Faculty and Departmental and Programme Committee levels. Based on initiatives from staff and students, the Programme Committee may change up to 10% of the programme without recourse to Faculty level and above. However, meetings of the Programme Committee appear to be irregular and un-minuted.

Information on student opinion was collected for the SAR by a student poll and the university's Centre for Quality Assurance and the VU Student's Union also collects annual student opinions, but these are collated at university level and do not feedback directly to the programme management, or to individual members of staff. Some staff collect student opinions at the end of a course, but others do not. A formalised system to collect student views at the course level (as happens in some other VU Faculties and other Lithuanian universities) is essential.

Improvements to the programme suggested in the 2005 review have been duly implemented and it is clear that the Programme Committee has been actively improving the programme in the 2005-11 period, for example in the re-timetabling of courses and targeting of staff appointments.

Employers interviewed during the review confirmed that they had *ad hoc* and informal input into suggested improvements to the programme, but there is no formal mechanism to productively enhance this dialogue with employers.

Without better information from stakeholders, it is difficult to envisage an effective and efficient process of internal quality assurance, or any effective annual programme review mechanism.

Main strengths and weaknesses

Roles and responsibilities are clear but quality assurance suffers from inadequate mechanisms for data collection from stakeholders, and notably from students and employers. Formalisation of Programme Committee activity is necessary, preferably leading to a formal process of Annual Programme Review.

III. RECOMMENDATIONS

1. Consider the structure of the current programme as discussed in the overview report of VU geology provision which accompanies this programme-specific report.
2. Develop a mechanism for raising staff teaching skills to include, amongst other things, peer evaluation of staff teaching and annual evaluation of staff teaching..
3. Improve the teaching of transferable skills, such as basic literacy, analytical and advocacy skills, by means of the introduction of compulsory formative assessments to complement the current 'summative assessment only' system.
4. Introduce measures to improve both staff and student mobility – in the case of staff by more flexible timetabling – in the case of students by better information on available opportunities.
5. Introduce a better system for collecting annual stakeholder opinions – in the case of employers, possibly an annual 'employers' forum' – in the case of students, an anonymous post-course/module student opinion survey.
6. Introduce an Annual Programme Review process for the Programme Committee to consider data collected under 2 and 5 above, together with other data e.g. intake figures, progression rates, final results, employment statistics etc.

IV. GENERAL ASSESSMENT

The study programme Environmental Hydrogeology and Geoengineering (state code – 612F77001) 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	3
2.	Curriculum design	3
3.	Staff	2
4.	Material resources	2
5.	Study process and assessment (student admission, study process student support, achievement assessment)	2
6.	Programme management (programme administration, internal quality assurance)	3
	Total:	15

*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.

Grupēs vadovas:
Team Leader:

Prof. David Eastwood

Grupēs nariai:
Team members:

Prof. Alvar Soesoo
Prof. Valdis Seglins
Dr. Gražina Skridlaitē
Andrius Platakis