



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Aleksandro Stulginskio universiteto
ŽEMĖS ŪKIO INŽINERIJOS IR VADYBOS PROGRAMOS
(621H10001, 62609T101)
VERTINIMO IŠVADOS

EVALUATION REPORT
OF AGRICULTURAL ENGINEERING AND
MANAGEMENT PROGRAMME (621H10001, 62609T101)
STUDY PROGRAMME

At Aleksandras Stulginskis University

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DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Žemės ūkio inžinerija ir vadyba</i>
Valstybinis kodas	621H10001, 62609T101
Studijų sritis	technologijos mokslai
Studijų kryptis	bendroji inžinerija
Studijų programos rūšis	universitetinės studijos
Studijų pakopa	antroji pakopa
Studijų forma (trukmė metais)	dieninės studijos (2), iššęstinės studijos (3)
Studijų programos apimtis kreditais	120 ECTS
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	bendrosios inžinerijos magistras
Studijų programos įregistravimo data	1997 gegužės 16 d.

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Agricultural Engineering and Management</i>
State code	621H10001, 62609T101
Study area	Technological Sciences
Study field	General Engineering
Kind of the study programme	university studies
Cycle of studies	second
Study mode (length in years)	full time (2), part-time (3)
Scope of the study programme in credits	120 ECTS
Degree and (or) professional qualifications awarded	Master of General Engineering
Date of registration of the study programme	May 16 1997

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I. INTRODUCTION

Since 1997, the Faculty of Agricultural Engineering and Management of the Aleksandras Stulginskis University has offered a Masters' degree in Mechanical Engineering in the study field of Agricultural Engineering and Management. In the external assessment of the study programme carried out in 1997 the Bachelor's programme received a positive evaluation. An external evaluation of several study programmes conducted in the study field of Mechanical Engineering and offered in the Faculty (including that of Agricultural Engineering and Management) was carried out in 2008 by a group of experts . While the expert group recommended that the study programme be granted unconditional accreditation, the Council of Study Assessment Experts (SKVC, Order No. 4-994 of April 6 2009) did not approve of conclusions of the expert group and the study programme received conditional accreditation for 3 years. It was also recommended to the University to merge the study programmes and award a degree of master of general engineering and establish specialisations.

This evaluation report is based on the self-assessment report submitted by Aleksandras Stulginskis University and a visit to the university by the Expert Group on 23rd march 2012 during which relevant facilities were inspected and discussions were held with the following groups:

- University Administration
- Self-assessment group
- Faculty and teaching staff
- Students
- Alumni and employers

The reader is also kindly asked to consult the general overview report (annex) to become acquainted with general remarks and recommendations addressed to all curricula evaluated during the visit.

II. PROGRAMME ANALYSIS

1. Programme aims and learning outcomes

The stated aim of the study programme of Agricultural Engineering and Management at the Aleksandras Stulginskis University is 'to provide future Masters with knowledge of the study field of General Engineering and abilities to self-dependently and creatively apply it in research and creative work, acting in the sphere of engineering management or developing original thinking and specialized problem-solving skills required for preparation to third cycle studies', as stated in the self-evaluation report. The aim defines the spheres of the graduate's activities namely: research activity requiring appropriate qualification (including doctoral studies), creative or any other professional activity in various spheres of engineering management. The learning outcomes of individual study subjects are stated in clear, non-technical form which is publicly accessible, written in the comprehensive language. They are well defined and clearly mapped into the knowledge, understanding and abilities which a successful graduate will be expected to possess on completion of the Masters programme. They conform to the requirement for the qualification of the trained specialists established according to Level 7 in European Qualification Framework i.e. that specialists are trained for research, creative or other professional activities which require expert evaluation and application of knowledge at the forefront in the field of work. Participation in international programmes such as Erasmus, NOVA-BOVA and Leonardo da Vinci is designed to ensure that both students and teachers are exposed to international teaching and learning methods as well as the knowledge and skills of their peers in other countries. However there is insufficient participation in these mobility programmes by students because of lack of sufficient study subjects in foreign languages and

students reported difficulty in finding suitable study subjects in host institutions. It is recommended that the number of study subjects taught in foreign languages should be increased. The faculty should also be more liberal in mapping study subjects in host universities to those at ASU.

The learning outcomes are consistent with the requirements for Masters' graduates in the study field which are for specialised knowledge and abilities to solve complex and unpredictable problems in the sphere of Agricultural Engineering and Management and preparation for research at doctoral level. The demand for graduates of the study programme is based on the Lithuanian National Sustainable Development Strategy (until 2020) with identified demand for specialists of high qualification, who are able to apply scientific achievements for technological processes in terms of quality, safety and environmental protection and to develop projects based on them. The demand for specialists in agricultural companies, capable of managing safety, quality and environmental issues, for 2009-2013 is predicted to be 15-20 engineer-managers per year, as stated in the self-evaluation report. It can therefore be said that the programme aim and learning outcomes are based on academic and professional requirements, public needs and the needs of the labour market.

The name of the programme is Agricultural Engineering and Management. While this is an appropriate name for the programme, a large part of the curriculum is oriented towards Occupational Safety, Environmental protection and Quality Management. Discussions with alumni and employers indicated that most of the graduates of the programme work mostly in management roles with responsibility for occupational safety, environmental protection, quality assurance and general business management. A vast majority of the final Masters papers are also in these subjects. Consideration should therefore be given to renaming the programme 'Master in Human Safety Engineering, Quality Assurance and Environmental Management' and revising its content accordingly. This will open up the programme to graduates of other disciplines and thus increase the pool of potential students to counter the falling numbers of students admitted to the programme.

2. Curriculum design

The curriculum design meets legal requirements in all respects. According to the Self Evaluation Report, the programme complies with the national legal acts and the regulations for the Masters study programmes. The total volume of the study programme is 120 ECTS credits. The study programme consists of: study subjects of high problem-based or innovative scientific level (66 cr. or 55 percent of the study programme value), study subjects that aim to prepare students for doctoral studies, study subjects in other study fields (24 cr. or 20 percent) and Master's paper (30 cr. or 25 percent).

The study subjects are spread evenly with 30 ECTS credits per semester (FT) and 18-24 ECTS (PT) being taken, the number of subjects per semester does not exceed 5. On the whole care has been taken to ensure a logical sequence in the delivery of the course modules consistent with the learning outcomes without undue repetition of material although it would be expected that some revision of prior material would be appropriate in linking previously taught material (from first cycle) to new material. However, although self-evaluation report indicates that 'Mathematical Statistics and Modelling' is a prerequisite to 'Measurements in the Engineering of BioSystems', both of these study courses take place in Semester 1 so they run concurrently. It is felt that Probability Distributions could be taught in the 'Measurements' study subject rather than in 'Statistics', progressing to measurement uncertainty.

The expert group also feels that there are gaps in the curriculum in the areas of ground water engineering and global sustainability issues. Ground water engineering is very important

since water is the life blood of agriculture and its proper provision determines success of crops. Ground water is also a means for dispersion of pollutants. The design and management of irrigation schemes and control of water flow on farms are crucial to soil management. Sustainability issues are covered in the study subjects 'Biomass Production Engineering' (renewable energy etc.) and 'Engineering Ecology' (environmental pollution, ecotechnologies etc) but the global perspectives of sustainability as well as global issues in agriculture need to be included in the curriculum.

The content of the study subjects is generally at the level that would be expected for a Masters programme i.e. high scientific content designed to prepare the graduates for doctoral studies and professional practise. The exception is 'Mathematical Statistics and Modelling' which is considered by the expert group to be too basic for Masters level and would recommend that more sophisticated statistical modelling tools be taught such as network analysis, linear programming and those linked to risk assessment as well as DOE (design of experiments, statistical trials planning).

A combination of lectures, tutorials, seminars and practical work is used in delivering the modules. Some of the practical work involves team work which is appropriate to achieve the learning outcomes. The scope of the individual study subjects and the programme as a whole is sufficient to ensure the learning outcomes. The proportion of contact hours varies from 30 to 45 percent for most modules apart from the Masters paper and research projects. The expert group feel that the proportion of contact hours could be reduced.

The three research modules provide an opportunity for the students to engage with the research work of the teachers. It is obligatory for Masters students to present the results of their research at an internal conference for young scientists held annually in the faculty or an international scientific-practical conference 'Human and Nature Safety' held by the Department of Occupational Safety and Management and to publish their research papers in the proceedings of these conferences.

The process of internal quality assurance has been established by the Statute of ASU. This provides for an annual review of the study programme based on the model proposed by European Foundation for Quality Management as well as provisions and guidelines of quality assurance in European higher education. This has been implemented by the university since 2010 and should ensure that the content of the programme is updated annually to reflect the latest achievements in science and technology. Study subject materials are still being prepared for placement in the virtual learning environment 'Moodle'. Training courses will be provided for teachers to produce material. Consultation sessions with teachers are available for all sets of students, Full Time and Part Time.

3. Staff

According to the self-evaluation report, all the teachers on the programme meet the qualification requirements. The full-time staff is made up of 3 professors, 8 associate professors and 2 lecturers with doctor's degree. They are all well qualified and have requisite experience in the subjects which they teach. This satisfies the legal requirements as set out by the order of the minister of education and science. The student-staff ratio is good but this does not take account of teaching on other programmes by the teachers. The average age of the teachers is about 51 (ranging from 39 to 66).

The teachers are all active researchers with an average of 10.4 publications per teacher in the period 2007-2011, 2.7 in ISI editions, 4.2 in international scientific databases and 5.2 in other

scientific publications, states the self-evaluation report. It is noted that most of the publications are in national rather than international journals and specialist international conferences. There appears to be an active culture of scientific research in the faculty with teachers actively participating in conferences both in Lithuania and abroad as well as regularly hosting scientific conferences. The science, study and business centre project 'Nemunas valley' will probably provide new research facilities providing opportunities to take part in European FP7 projects in the areas of occupational safety, renewable energy, bio-energy and tribology. Teachers have the right and obligation to develop their professional competence through study trips and research. Opportunities are provided for human resources development implemented in the University, LLP/ERASMUS programme projects, courses of professional development, scientific discussions, scientific-practical seminars, academic readings and international scientific conferences. However teachers are reluctant to take advantage of the mobility programmes such as Erasmus with only 2 teachers taking part between 2007 and 2010. It appears that the reason for this is lack of adequate financial support. It is essential that adequate financial support is provided to enable teachers engage with the international scientific community by attending international conferences as well as taking part in mobility programmes.

Teachers seem to spend a high proportion of their time in pedagogical activity (between 52 and 60 percent,). This is because of the high proportion of contact with students. If the proportion of student self-study is increased, this will release more time for teachers to engage in research activities and improve the scientific content of the studies.

4. Facilities and learning resources

The classrooms are adequate in both their size and quality. Stationary computer projection facilities are available in the major classrooms and mobile ones are available from the Dean's office for other classrooms. A major renovation programme of the classrooms is being carried out to bring buildings to contemporary European standards. Computer laboratories are equipped with personal computers which have most of the popular CAD and CAE software necessary for the teaching of mechanical design and analysis installed. Further new hardware and software is to be purchased under the project 'Improvement of the First and second Cycle Study Programmes of Agricultural Profile and Teachers' Competence Development' (ŽŪ-SPDK', No. VP1-2.2-ŠMM-09-V-01-002). In 2011 carrying out the integrated Land, Forest, Water and Food Industry Science, Studies and Business Valley project "Nemunas valley", there are plans to establish several scientific and study laboratories in the renovated premises of the department of Agricultural Machinery. These will be employed for both teaching and research work on the Masters programme. The laboratories of the centre of Engineering of Biosystems, Biomass Energetics and Water Engineering of the "Nemunas valley" will also be employed. These laboratories should provide for modern facilities for the practical training and research work of the students. Classroom and laboratory facilities for teaching, seminars and practical work are sufficient in terms of volume and equipment for the purposes. Laboratories are well equipped with many up to date hardware and appropriate software for the purpose of training the students in modern technology methods.

Practical training of students is conducted in institutions and companies of social and economic partners. Placements with such organisations are coordinated by the Careers' Centre. It would appear that there is no problem in finding placements for students. About one third of students have their practice in institutions which have signed bilateral cooperation agreements with the University and in companies of University patrons, according to self-evaluation report.

Library resources are good with a large volume of titles and copies as well as subscription to 18 000 scientific journals accessible through 18 foreign electronic data bases in addition to

printed journals. Electronic copies of theses and dissertations are available in the library and are placed in the general Lithuanian database. Books and publications unavailable in the library may be obtained through the National libraries or through inter-library loans. Textbooks and other publications are sufficient and available in the electronic database accessible to students. Some monographs have been prepared by university researchers who teach on the study programme. However, these need to be regularly updated with more modern material as there were complaints from students that some of the material is outdated. Internet access is available in Bibliographic reading room and wireless internet access is available in student reading rooms.

The virtual learning environment, Moodle, has been introduced but implementation is still in the early stages.

5. Study process and student assessment

Student admission is on a competitive basis. First cycle graduates of Mechanical engineering as well as other technological studies with additional completed studies may be admitted. Competition scores are calculated by a given formula. The number of applicants and the number of admitted students has decreased in the last years. However the average score has increased (7.35 to 8.18).

The study process is well organised and adequate provision is provided for the students to achieve the learning outcomes. Self-study represents about 67 percent of total hours. Master degree students take active part in science and are required to take part in conferences/seminars organised by the faculty (local and international). Students' participation in practical classes and seminars is obligatory. However, participation in lectures is not obligatory – students can choose self-study instead of attending lectures. Average score in exams was very high (8.43) motivated by students wanting to retain public funding. Drop-out rate during assessed period was 3.7 percent mostly due to academic debt. Students are allowed to study to individual programmes to reduce drop-out rates, taking longer than two years. Students are supplied with adequate information on the study programme on line and on notice boards. Students are able to consult teachers by email or during set consulting hours. As stated in the self-evaluation report, scholarships are given for academic achievement – stipends from companies are increasing. Support is available for socially disadvantaged students e.g. free accommodation, and scholarships. Internet access is available in dormitories at low cost.

The assessment of courses is based on 10 point scale as approved by Minister for Education. Master is awarded based on the cumulative score over the programme. Students are made aware of the assessment tasks and the assessment criteria at the beginning of the course. They also get guidelines for self-study work. Regular testing is carried out through interim tests. Students with poor performance are invited for individual counselling. Completion rates are very high – about 87 percent . Although mobility opportunities are available only a small proportion of students avail themselves of the opportunity – 13.7 percent. Plans are being made to increase number of subjects taught in English and Russian to encourage mobility. 98 percent of graduates are employed within 2-3 months of graduation. Surveys conducted to elicit the demand for specialists, and the satisfaction of employers with the skills of the graduates, indicate that there is a continuing demand for graduates of the programme. Occupational safety, quality assurance and environmental management are seen as crucial to the Lithuanian economy and there is no other study programme in Lithuania which produces specialists in these areas in combination with engineering. There is a danger that with the falling number of students, there may not be enough specialists produced to satisfy the employment needs in the future.

6. Programme management

The faculty administration is responsible for organisation of studies and administration of students' work and their achievements including documentation of registration, timetabling of courses, records of coursework results, examinations and grades achieved, student mobility, academic achievements and final degree grades. The study programme is monitored by the study programme committee. The committee is made up of teachers on the study programme plus a student representative and a representative of the social stakeholders. Programme management procedures are governed by the University Statutes. The process of administration of the study programme and internal quality assurance is provided for in the University Statute and in the Conception of University Study Quality Assurance created in 2008 and is based on the European Foundation for Quality Management. Information and data on implementation of the programme is collected through annual surveys of students and biennial survey of teachers. The information and data are analysed and published. The data collected is very comprehensive. As mentioned in the global report, feedback from action taken on the results of the surveys should be made available to students. The data of employer surveys reveal that they positively evaluate practical abilities of the graduates, their loyalty, and communication skills but are dissatisfied with the level of theoretical knowledge of some graduates. According to employers' opinion, written in the self-evaluation report, the changes in the study programme in terms of applied engineering, environment, safety and business management are timely and appropriate.

However, the huge workload of the Committee members in the study process leaves little time for direct improvement of study quality and this is seen as a hindrance to improving programme quality and efficiency. Therefore it is felt that the efficiency and effectiveness of the internal quality assurance measures could be improved by reducing the workload of the teachers.

Inadequacies pointed out in the last external assessment have been addressed and the study programme has been improved. The question of the professional development of the teachers has also been addressed through competence development including e-learning. Finally, remarks about poor laboratory equipment have been addressed with renewal of learning resources.

III. RECOMMENDATIONS

3.1. The title of the programme (Agricultural engineering and management) does not fully describe the curriculum and the specialisation of the graduates in their final Master papers. Therefore consideration should be given to changing the title and orient it more towards safety engineering, quality and environmental management.

3.2. The content of the study subject 'Mathematical Statistics and Modelling' is considered by the expert group to be too basic for Masters level and should be upgraded to include more sophisticated statistical modelling tools such as network analysis, linear programming and tools linked to risk assessment.

3.3. New study subjects in the areas of ground water engineering and global sustainability should be introduced into the curriculum.

3.4. The proportion of teacher's time spent in pedagogical activity should be reduced to release more time for teachers to engage in research activities and improve the scientific content of the study subjects.

3.5. Teachers should be encouraged to participate in international mobility programmes with provision made for longer visits (3 to 6 months) which will allow the participant time to absorb the latest technological developments and participate in the research in host institutions to the benefit of their own research on return to Lithuania.

3.6. Academic staff should engage more with the international community by attending international conferences and publishing in the top international journals in their field.

3.7. Nomographs produced by teachers should be regularly updated with more modern material. Greater use of textbooks and documentation in English language should be encouraged to relieve teachers of the onerous task of writing nomographs.

3.8. More students should be encouraged to participate in international mobility programmes by expanding the range of optional subjects, making it easier for them to find appropriate study subjects in host institutions.

3.9. The number of study subjects taught in foreign languages should be increased to encourage the number of in-coming international students.

3.10. A strategy should be devised to arrest the decline in the number of students admitted to the programme including, maybe, increasing the number of state-funded places.

IV. SUMMARY

1. Programme aims and learning outcomes

Strengths:

The study programme addresses a real on-going need of providing manpower to fill vacancies in companies in the agricultural sector and general engineering sector of the Lithuanian economy capable of special skills in occupational safety, quality assurance and environmental and business management. Therefore graduates are very likely to find employment.

The graduates of the programme are multi-skilled, possessing both engineering, occupational safety and environmental and business management skills. This particular combination of skills is a great advantage when working for small companies which make up a large percentage of the Lithuanian agricultural and engineering sector. These companies are unlikely to be able to employ a specialist in business, safety and environmental management in addition to a specialist engineer. The skills set also means that graduates have a wide range of employment opportunities.

Weaknesses

The title of the programme (Agricultural engineering and management) does not fully describe the curriculum and the specialisation of the graduates in their final Master papers. Therefore consideration should be given to changing the title and orient it more towards safety engineering, quality and environmental management.

2. Curriculum design

Strengths

An annual conference for young scientists is organised by the faculty.

International scientific conference 'Human Nature Safety' held by the Department for Occupational Safety.

Requirement for students to publish a scientific paper from their research

Weaknesses

Content of Mathematical Statistics and Modelling is considered to be too basic for Masters level.

There are gaps in the curriculum in the areas of ground water engineering and global sustainability issues.

3. Staff

Strengths

All teachers are generally well qualified and sufficiently experienced and meet the qualification requirements.

There is an upward trend in research income as well as the volume of research output with active participation in conferences and organisation of conferences.

Teachers have the right and obligation to develop their professional competence through study trips and research and opportunities provided for human resources development implemented in the university.

Weaknesses

Teachers spend too high a proportion of their time in pedagogical activity leaving insufficient time for research.

Reluctance of teachers to participate in international mobility programmes such as Erasmus.

Most study visits are very short and insufficient for teachers to engage in the research of the host institution and absorb the latest technological developments in their field.

Insufficient participation in international conferences and publication in top international journals.

4. Facilities and learning resources

Strengths

New laboratory facilities provided by the 'Nemunas' valley project.

Practical training of students which is conducted in companies, farms and institutions and the coordination of placements by the Careers' Centre which ensures enough places are available for all students.

Good library facilities

Weaknesses

Incomplete implementation of the virtual learning environment (Moodle)

Outdated learning material provided by some teachers

5. Study process and students' performance assessment

Strengths

Admission based on competition.

Best students get state financed places.

Scholarships for exceptional academic performance

Help available for socially disadvantaged students

High employment rates of graduates

Weaknesses

Falling number of students

Voucher system limiting number of state-financed places.

Low take-up of mobility programmes

6. Programme management

Strengths

Structures and programme management are in place

A huge amount of data is gathered and analysed and made available to stakeholders

All stakeholders (teachers, students, social stakeholders) are represented on programme evaluation panels and regular surveys of student and teachers are held.

Opinion of employers are sought on changes to the study programme.

Weaknesses

Lack of efficiency in improvement of study quality due to huge workload of teachers.

IV. GENERAL ASSESSMENT

The study programme *Agricultural Engineering and Management* (state code – 621H10001, 62609T101) of Aleksandras Stulginskis University is given **positive** evaluation.

Study programme assessment in points by evaluation areas.

No.	Evaluation Area	Evaluation Area in Points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	2
3.	Teaching staff	3
4.	Facilities and learning resources	3
5.	Study process and students' performance assessment	3
6.	Programme management	3
	Total:	17

*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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