



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

VILNIAUS GEDIMINO TECHNIKOS UNIVERSITETO
STUDIJŲ PROGRAMOS
MECHANIKOS INŽINERIJA (valstybinis kodas – 621H33001)
VERTINIMO IŠVADOS

EVALUATION REPORT
OF MECHANICAL ENGINEERING (state code – 621H33001)
STUDY PROGRAMME
at VILNIUS GEDIMINAS TECHNICAL UNIVERSITY

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Išvados parengtos anglų kalba
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Vilnius
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DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Mechanikos inžinerija</i>
Valstybinis kodas	621H33001
Studijų sritis	Technologijos mokslai
Studijų kryptis	Mechanikos inžinerija
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	Mechanikos inžinerijos magistras
Studijų programos įregistravimo data	2002 m. birželio 14 d.

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Mechanical Engineering</i>
State code	621H33001
Study area	Technology Sciences
Study field	Mechanical Engineering
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 Mechanical Engineerring
Date of registration of the study programme	June 14, 2002

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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 the 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 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:

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

Vilnius Gediminas Technical University (hereafter – VGTU) is a public higher education institution. The structure of the university is formed of 9 faculties, research and teaching laboratories, research and academic institutes and centres, a library, administration and other departments. Structural reorganization of the Faculty of Mechanics was implemented in 2013. The Department of Industrial Enterprise Management and the Department of Machine Engineering were incorporated into one unit and the department was given the name of Department of Mechanical Engineering. The new Department of Mechatronics and Robotics was established.

The Study Programme Committee for the first and second cycle study programmes was formed according to the Rector's of Vilnius Gediminas Technical University order No. 946, October 15, 2014.

1.4. The Review Team

The review team was assembled in accordance with the *Expert Selection Procedure*, approved by Order No 1-55 of 19 March 2007 of the Director of the Centre for Quality Assessment in Higher Education, as amended on 11 November 2011. The Review Visit to HEI was conducted by the team on 2nd February, 2015.

1. Prof dr. David Kennedy (team leader), Head of Mechanical Engineering Department, Dublin Institute of Technology, Ireland.
2. Dr. Rynno Lohmus, Head of the commission of Estonian Higher Education Quality Agency; Senior Researcher at Faculty of Science and Technology, Institute of Physics, University of Tartu, Estonia.
3. Prof dr. François Resch, Professor Emeritus, Institute of Engineering Sciences, University of Toulon, France.
4. Prof. dr. Jolanta Janutėnienė, Head of the Mechanical engineering Department, Faculty of Marine Engineering, Klaipėda University, Lithuania.
5. Dr. Vigantas Kumšlytis, Manager of materials engineering and technical analysis at Public Company “Orlen Lietuva”, Lithuania.
6. Mr. Mantas Kinderis, 3rd year student of *Car Electronics* study programme, Vilnius College of Technology and Design, Lithuania.

II. PROGRAMME ANALYSIS

2.1. Programme aims and learning outcomes

The purpose of the programme is clearly stated as to prepare specialists of mechanical engineering to be able to solve complex engineering tasks and develop and produce mechanisms and machines by applying advanced research methods.

In the Self-evaluation report, it is declared that the study programme has two specializations:

- Environmental Protection Equipment Design and Production;
- Mechatronics.

Since the year 2014, the specialization in Mechatronics is implemented as an individual study programme by the Department of Mechatronics and Robotics.

The programme aims are clearly defined and divided into groups related with specialized knowledge in Mechanical Engineering; development and production of technologies upon applying the research methodology; skills in management and innovativeness applicable in training or working environment bound with Mechanical Engineering; development broad erudition.

Some of these statements are formulated properly, but they are not well organized and need to be rewritten. For example, one of the aims of the study programme is as follows: “to provide the students with recent specialized knowledge in Mechanical Engineering usable as a basis for research works and development of new technologies” (SER 12 p.). They should be written to reflect what a graduate is capable of demonstrating on completion of the programme.

The aims of the master study programme of *Mechanical Engineering* satisfies in the main the investigation areas of the master programmes but can be rewritten in a more clear manner. However, the objectives of the study programme specialization of *Environmental Protection Equipment, Design, and Production* are not reflected in the aims of the study programme.

The programme outcomes of *Mechanical Engineering* study programme are formulated upon assessment of conformity to the requirements set for the competence of specialists in Mechanical Engineering. In the study programme, the learning outcomes of studies are divided into five groups: knowledge and its application; understanding required for research works; special skills; social skills, and general skills, all in line with the Descriptor of Study Cycles approved by the Ministry of Education and Science of Lithuania.

The provision of knowledge is defined by 3 main groups (SER 12 p.):

1. Fundamental research and innovation knowledge, the reliability theory, concepts, laws, and numerical methods.
2. The principal knowledge in the study field of Mechanical Engineering.
3. Knowledge in special sciences related to machine and equipment control and measurement systems, ecology, diagnostics, monitoring, experimental works, machine and equipment design, production and use, settlement of engineering problems upon application of modern information technologies.

Knowledge related to specializations is defined by “<...> application of advanced high tech in Mechatronics as well as in environmental protection equipment design and production” (SER 12 p.).

Information about the study programme is publicly accessible and presented in the web page: <http://www.vgtu.lt/studijos/studiju-programos/magistranturos-studiju-programos/26680?pid=67347>.

<http://www.aikos.smm.lt/aikos/index.htm>.

The programme learning outcomes in mechanical engineering direction are clearly defined and publicly accessible at: <https://medeine.vgtu.lt/programos/programa.jsp?fak=4&prog=107&sid=F&rus=U&klb=en>

The learning outcomes of the study programme specialization *Environmental Protection Equipment Design and Production* could be identified more specifically by reflecting actuality of *Environmental Protection Equipment*.

The programme aims and learning outcomes are based on the academic and professional requirements, public needs and the needs of the labour market. In the Self-evaluation report statistical data is given: “certain trend of growing is forecasted for the next year as well. Enterprises of various branches of industry always need mechanical engineers. The total forecasted growth of the need in specialists in all fields of engineering is 13.4%.” (SER 16p.)

The programme aims and learning outcomes are consistent with the type and level of studies and the level of qualifications offered.

During the meeting with the administration and staff responsible for Self-evaluation report, methods of publicity of the programme were discussed and concluded that programme international publicity as an opportunity to attract foreign students still needs to be improved.

The name of the programme, its learning outcomes, content and the qualifications offered are compatible with each other. The name of the programme its qualifications offered is related with the mechanical engineering area and is also compatible with each other. Content of the study programme are related also with the specialization *Environmental Protection Equipment Design and Production*.

There is a sufficient demand for mechanical engineering master's degree graduates and the curriculum objectives reflect the current level of technology and knowledge requirements.

In conclusion, aims and learning outcomes have been improved since the last evaluation but they should be rewritten in a clearer and more efficient manner.

2.2. Curriculum design

In the Self-evaluation report, it is declared that the creation of *Mechanical Engineering* study programme was based on the following legal acts:

- Republic of Lithuania Law on Higher Education and Research, April 30, 2009, No. XI-242, Vilnius;
- General requirements of the Second Degree Study Programmes and its amendments approved by Order No. V-826 of June 3, 2010 of the Minister for Education and Science of the Republic of Lithuania.

The curriculum design meets legal requirements as it has been designed in conformity with description of the general conditions for the Master's Degree Study Programmes.

By Order of Director of Centre for Quality Assessment in Higher Education "On Approval of the Methodology for Evaluation of the Ongoing Study Programmes" and its amendments (December 20, 2010, No. 1-01-162) scope of Self-evaluation report must be about 30 pages and also the conclusions of previous evaluation must be no longer than 2 pages. However, the Self-evaluation group did not take attention to these requirements and has provided a Self-evaluation report of 40 pages.

Study subjects are spread evenly. The content of the subjects is consistent with the type and level of the studies. Master level study subjects which give deeper knowledge in mechanical engineering area: Reliability Theory, The Use of the Finite Elements Method in Continuum Mechanics, Experimental Mechanics, Theory of Flow.

Study subjects which are raising knowledge about environmental and its equipment, for example: Engineering Ecology, Environmental Protection System, Environmental Protection Strategy and Tactics, Measurement Systems in Environmental Protection Equipment.

The scope of the programme is sufficient to ensure that learning outcomes are met. The total volume of *Mechanical Engineering* second-cycle study programme is 120 ECTS credits, 3200 hours. The total duration of contact teaching (at auditoriums, laboratories as well as practical training and consulting) is 772 hours (24.3 % of the total volume of the programme). 420 hours (54 % of contact hours) are used for lectures, 180 hours (23,1 %) are used for practical training, and 178 hours (22,9 %) are used for consulting at auditoriums.

The studies last for 4 semesters. The volume of a semester is 30 ECTS. The studies are finished by preparation and defence of the Master thesis. Teaching in the semesters 1–3 continues for 15 weeks, 4-week examination session takes place. In the semesters 1–3, one week of self-guided work is provided. The 20-week semester 4 is provided for finalizing and defence of the Master Thesis. In a semester, the total number of compulsory course subjects and project does not exceed the allowed limit of 5 modules. The studies is organized is in accordance with legal requirements.

The content of the programme reflects the latest achievements in mechanical engineering. During the site visit it appeared that the students' research theme is often carried out as a continuous course projects during the two years of study. Therefore, the students have adequate time to deep insight into the topic of research. After the evaluation of the Final thesis the Review team can conclude that the level of scientific research is appropriate and of a high quality.

The logic of the programme is presented clearly in the SER as well as during the site-visit in meetings with teachers where the curriculum design of the programme was discussed additionally.

There are still some uncertainties in this study programme as it has only one specialization from the year 2014. Specialization „Mechatronics“ is not realized anymore. Meanwhile many master's theses of Mechatronics specialization was presented for the assessment and graduates of this specialization were also invited to meet the Review team.

The information about the study subjects was presented in SER in a very short form, only annotation. It was difficult to analyse study subjects of the master study programme in comparison with the subjects of bachelor studies. After discussion with department teachers to seek clarification, it was suggested that more detailed descriptions of subjects themes should be written in the part B. For evaluation, only part A of study subjects were presented.

2.3. Teaching staff

The study programme is provided by the staff meeting legal requirements. All university teachers involved in teaching course units under *Mechanical Engineering* second-cycle study programme meet the requirements for university teachers set in the Law of Republic of Lithuania on Science and Studies and the Description of the General Requirements for the Degree programmes of the Second Study Cycle.

Mechanical Engineering study programme is being implemented by academic staff from the Department of Mechanical Engineering of the Faculty of Mechanics, the Department of Computer Engineering of the Faculty of Electronics and the Department of Transport Technological Equipment of the Faculty of Transport Engineering.

The number of the teaching staff is adequate to ensure learning outcomes. Total 10 university teachers are involved in implementation of *Mechanical Engineering* study programme, including: 4 Professors (40%) and 6 Associate Professors (60%). The research activities of Professors and Associate Professors conform to the course units they teach.

During both courses number of students fluctuates around 35-40 students, then one full-time employed teacher has about 3-4 *Mechanical Engineering* Master's program students.

The experience of a majority of the university teachers involved in the study programme is over 10 years. Within the last 5 years, the university teachers involved in implementation of *Mechanical Engineering* study programme compiled and published: 2 monographs; 4 course books, 7 study-guides; 6 training and methodic guides. The qualifications of the teaching staff are adequate to ensure learning outcomes.

Each university teacher should improve his/her qualification at least once within the five-year term of office by trainee job at enterprises or research centers (for 1-4 months). Four teachers improved their qualification by trainee job at enterprises or research centers in the period of 2019-2014.

There exist mobility possibilities for teachers. Over the past five years, 6 teachers of the Department participated in the Erasmus exchange program. All teachers of master study programme participate in the research work, write and print paper in the scientific journals. Mostly scientific papers are printed in ISI WOS journals of Lithuania (*Mechanika*, *Journal of Vibroengineering*) also some of them are printed in international scientific journals.

Methodical books prepared by teachers of Department are mostly written for the bachelor studies. For master studies 2 monographs in mechatronic scientific area were printed.

Teaching staff turnover is able to ensure an adequate provision of the programme. The average age of the university teachers involved in *Mechanical Engineering* study programme is 48 years. "In the analyzed period (5 years), the study programme was being implemented by 6 Professors and 6 Associate Professors" (SER 26 p.). 7 PhD. students of the Department of Mechanical Engineering defended their theses in last 5 years, also 7 persons are involved in doctoral studies at the Department at this moment.

From the Self-evaluation report and during the meeting with teachers and doctoral students it is clear that new teachers are prepared, natural change takes place in order to ensure the necessary programme implementation.

The teaching staff of the programme is involved in research directly related to the study programme being reviewed. In the 2008-2014 period few teachers from this department (V.Vekteris, M.Jurevičius) were involved in 2 research projects founding by ES and qualifying research works. Also teachers participated in few study programme? improvement projects and qualifying research works. All qualifying research works are related with Mechanical engineering area and Mechatronics.

In the Self-evaluation report no information about project related with specialization *Environmental Protection Equipment Design and Production* was provided.

Professional development of the teaching staff necessary for the provision of the programme mostly is done by the personal initiative. The administration of university needs to search for more possibilities for funding research projects, participation in the international conferences and other research activities. This opinion was discussed in the meeting with teaching staff.

2.4. Facilities and learning resources

The premises for studies are adequate both in their size and quality. In the Self-evaluation report is presented information that “the Faculty of Mechanics includes twenty-six premises with 869 common-use working places (such as auditoriums, laboratories, methodology rooms, computerized classrooms). The total area of the premises is 2532 sq. m. The said area also includes the laboratories arranged in the cellar (their total area is 920 sq. m.). The auditoriums provide total 594 places for students.” (SER 32 p.) The number of places at laboratories, rooms and computerized classrooms are adequate. Theoretical and practical lessons and lectures take place at auditoriums of the Faculty of Mechanics. The auditoriums are equipped with multimedia projectors. A total of 4 computerized classrooms are provided at the Faculty.

The same laboratories are used for bachelor and master studies. The amount and quality of equipment is satisfactory. In these laboratories are a few equipment for master studies where they can perform scientific research. For master studies a software package “Labview“ is used which is a multipurpose tool of a researcher usable for analytical computations, processing of signals of an experiment, superposition of virtual and real experiments. Master students also have possibility perform research investigations in companies JVS Amalva” JVS “Vilpros pramonė” JVS “Traidenis”.

Students of the II cycle use resources and services of the Vibroacoustic Research and Diagnostics training laboratory of the Department of the Mechanical Engineering. During a site visit to the Higher Education Institution, the Review team visited the learning and research laboratories.

Equipment in laboratories of Department is more appropriate for bachelor studies and also more related with specialization of *Mechatronics* which is closing from the 2014. More equipment for Master research should be available.

Teaching materials (textbooks, books, periodical publications, databases) are adequate and accessible. Literature required for students involved in VGTU *Mechanical Engineering* study programme is collected at the Central Library of the University (Saulėtekio al. 14) as well as the reading-room of the Faculty of Mechanics and the Faculty of Transport Engineering where 15 common-use working places, including 3 computerized spaces with MATLAB, AutoCAD, ArcGIS, SolidWorks and other software required for the studies are provided. The book stock of the Central Library has over 0.5 million publications. “University teachers and students are

provided access to over 20 databases of various fields of science and thematic books and journals, 3 archival stocks and 1 bibliographic information management tool *Refworks* plus 28 databases of various fields of science and thematic books and journals” (SER p. 35).

Teachers of the Faculty of Mechanics involved in *Mechanical Engineering* study programme prepared and published 12 manuals and study-guides in Lithuanian and English. These teaching materials are however more usable for bachelor studies.

2.5. Study process and students‘ performance assessment

The general requirements for admission to master studies are set forth in the Description of the Principles of Formation of the Second Cycle Study Programmes approved by the resolution No. 57-1.9. of Vilnius Gediminas Technical University Senate, as of May 29, 2012.

Bachelor of *Mechanical Engineering* direction as well as other technology fields of science undergraduates may be admitted to the *Mechanical Engineering* master study programme. Also it is required a compulsory course subjects of the bachelor study programme and the minimum volume of them.

In this study programme a student having completed a college study programme can be admitted. Main requirement is to complete the additional studies (bridging courses) of the lacking course units.

The organization of the study process ensures an adequate provision of the programme and the achievement of the learning outcomes. The duration of the studies is 2 years. The duration of semesters is 20 weeks: 15 weeks for working at auditoriums, 4 weeks – for examination session and 1 week – for self-guided activities. In the first semester, students work at auditoriums for 15 hours per week, in the second semester - 15 hours and in the third semester – 14 hours per week. In the fourth semester, Master Thesis is prepared and no lectures are planned. In the semester I-III, 3 credits are planned for the final work in each. The fourth semester is devoted only for the preparation of the Final Master Thesis.

Students have opportunities to participate in student mobility programmes. However, students are not aware of all the international exchange opportunities such as Erasmus practice, the terms of which are more flexible. Also students of master studies often don’t want to take advantage of this opportunity, because they are employed. Few students expressed such an opinion during the meeting. Master students participation in Erasmus exchange was very low in period of 2009-2014.

From the Self-evaluation report materials the Review team could form an opinion that the right assessment of knowledge and skills are developed. Students at the meeting took the view that the evaluation system is clear and understandable.

2.6. Programme management

The main internal bodies involved in decision making on the Faculty level are the Council of the Faculty and the Dean’s Office. For a settlement of problems of studies, the Study Committee is formed at the Faculty; on the University level – it is the Senate and the Rector’s Office. VGTU is in charge of the internal quality assurance system. At the Faculty of Mechanics, curators of the second cycle study programmes or their specializations are the relevant major Departments. The

study committee of the Faculty certifies modules of course subjects for a period from 1 to 4 years.

Students are involved in programme evaluation: they are asked to complete a questionnaire to assess study module content. Each teacher may access the results of the questionnaires. During the meeting with students they were asked about this survey, however it became clear that not all students participate in this survey. Also students are not fully interested in the results of this survey. Administration should encourage greater involvement of a student union in this process.

In SER (56 p.) it is stated that employers are included in the study programme assessment as members of the study programme committees. During the meeting the employers said that they do not feel difference between bachelor's and master's graduates. Employers accepting students to work are not interested what level of studies they have finished. It seems that the Departments' relations with social partners are not sufficient and not permanent. Therefore, the social partners could be invited more actively in the preparation and in the discussion about the *Mechanical engineering* master study programme and specialization *Environmental Protection Equipment Design and Production*. An internal quality assurance measures are implemented but lacks regular and formalized activities of the social partners.

It was also stated that outcomes of the previous external evaluation (2012) were used for improvement of the programme. It is clear that improvements were performed, but not in all areas. For example, the situation due to students' participation in international mobility has not changed. Due to internal reorganization in the faculty, study programme was changed leaving only one specialization and it is obvious that in the near future corrections of this programme can be made. Expert team would recommend to invite social partners, students and graduates to discuss about the aims, learning outcomes and teaching subjects of the study programme.

III. RECOMMENDATIONS

1. Study programme specialization *Environmental Protection Equipment Design and Production* needs to be explained in more detail within the aims and outcomes of *Mechanical engineering* study programme.
2. The research equipment, laboratory and computer equipment are adequate both in size and quality for the bachelor level. For the master studies basic research equipment and software is installed, which is related more with specialization of Mechatronics. The Expert team would highly recommend to strengthen the research related equipment for this specific master study programme.
3. Study programme administration could give more attention to international publicity of *Mechanical engineering* master study programme and should consider opportunities for foreign students' involvement in the programme.
4. Study programme management should focus more on involvement of students in programme development.
5. Master students are not interested in international exchange, they don't know about all possibilities. International exchange level in master studies could be increased by organizing Erasmus practice in foreign research institutions or enterprises.
6. Involvement of social partners in the development and improvement of *Mechanical engineering* master study programme must be constant and more formalized.

IV. SUMMARY

The programme aims and learning outcomes are based on the academic and professional requirements, public needs and the needs of the labour market. The aims of the master study programme *Mechanical Engineering* satisfies in the main the investigation areas of the master programmes but could be rewritten more accurately. The outcomes of the study programme specialization *Environmental Protection Equipment Design and Production* could be identified more specifically.

Master theses are of a good standard and quality. Teaching materials (textbooks, books, periodical publications, databases) are adequate and accessible. Laboratory equipment are sufficient to undergraduate studies, however there is a need to give more attention to renewal of the equipment for Master research work.

All teachers of master study programme participate in the research work, write and print paper in the scientific journals. University authorities should promote and create the financial conditions for publishing scientific papers in foreign journals.

Study programme has only one specialization *Environmental Protection Equipment Design and Production*. If the programme will continue with one specialization then the Department should clarify its needs and outcomes. These issues should be discussed with the social partners in order to achieve the best solution.

VI. GENERAL ASSESSMENT

The study programme *Mechanical Engineering* (state code – 621H33001) at Vilnius Gediminas Technical 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	2
5.	Study process and students' performance assessment	3
6.	Programme management	2
	Total:	16

*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. dr. David Kennedy
Grupės nariai: Team members:	Dr. Rynno Lohmus
	Prof. dr. François Resch
	Prof. dr. Jolanta Janutėnienė
	Dr. Vigantas Kumšlytis
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**VILNIAUS GEDIMINO TECHNIKOS UNIVERSITETO ANTROSIOS PAKOPOS
STUDIJŲ PROGRAMOS *MECHANIKOS INŽINERIJA* (VALSTYBINIS KODAS –
621H33001) 2015-03-16 EKSPERTINIO VERTINIMO IŠVADŲ NR. SV4-53-10 IŠRAŠAS**

<...>

VI. APIBENDRINAMASIS ĮVERTINIMAS

Vilniaus Gedimino technikos universiteto studijų programa *Mechanikos inžinerija* (valstybinis kodas – 621H33001) vertinama **teigiamai**.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	3
2.	Programos sandara	3
3.	Personalas	3
4.	Materialieji ištekliai	2
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	2
	Iš viso:	16

* 1 - Nepatenkinamai (yra esminių trūkumų, kuriuos būtina pašalinti)

2 - Patenkinamai (tenkina minimalius reikalavimus, reikia tobulinti)

3 - Gerai (sistemiškai plėtojama sritis, turi savitų bruožų)

4 - Labai gerai (sritis yra išskirtinė)

<...>

V. SANTRAUKA

Programos tikslai ir numatomi studijų rezultatai pagrįsti akademiniais bei profesiniais reikalavimais, visuomenės ir darbo rinkos poreikiais. Magistrantūros studijų programos *Mechanikos inžinerija* tikslai iš esmės atitinka magistrantūros programų tyrimo sritis, bet reikėtų juos tiksliau performuluoti. Būtų galima konkrečiau nurodyti šios studijų programos specializacijos *Aplinkos apsaugos įrenginių projektavimas ir gamyba* rezultatus.

Magistro darbai atitinka aukštus reikalavimus ir yra kokybiški. Metodinė medžiaga (vadovėliai, knygos, periodiniai leidiniai, duomenų bazės) yra tinkama ir prieinama. Laboratorinės įrangos užtenka pirmosios pakopos studijoms, tačiau reikia pasistengti atnaujinti magistro tiriamajam darbui reikalingą įrangą.

Visi magistrantūros programos dėstytojai dalyvauja mokslo tiriamojame veikloje, rašo ir moksliniuose žurnaluose skelbia straipsnius. Universiteto vadovybė turėtų užtikrinti finansines sąlygas, kad būtų galima mokslinius straipsnius skelbti užsienio žurnaluose.

Šioje studijų programoje yra tik viena specializacija – *Aplinkos apsaugos įrenginių projektavimas ir gamyba*. Jei ir toliau išliks tik viena specializacija, katedra turėtų paaiškinti jos poreikį ir rezultatus. Siekiant priimti geriausią sprendimą, šiuos klausimus reikėtų aptarti su socialiniais partneriais.

<...>

III. REKOMENDACIJOS

1. Studijų programos *Mechanikos inžinerija* tiksluose ir numatomuose studijų rezultatuose turi tiksliau atsispindėti šios programos specializacija *Aplinkos apsaugos įrenginių projektavimas ir gamyba*.
2. Mokslinių tyrimų, laboratorinės ir kompiuterinės įrangos skaičius bei kokybė atitinka bakalauro studijų poreikius. Pagrindinė magistrantūros studijoms skirta tyrimų įranga ir įdiegta programinė įranga labiau tinka mechatronikos specializacijai. Ekspertų grupė labai rekomenduoūtų sustiprinti šiai magistrantūros programai skirtos tyrimų įrangos išteklius.
3. Studijų programos administracija galėtų daugiau dėmesio skirti tarptautinei magistrantūros programos *Mechanikos inžinerija* reklamai ir apsvarstyti užsienio studentų dalyvavimo šioje programoje galimybę.
4. Studijų programos vadovybė turėtų labiau pasistengti, kad studentai dalyvautų programos tobulinimo procese.
5. Magistrantūros studentai nesidomi tarptautinėmis mainų programomis, nėra susipažinę su visomis galimybėmis. Dalyvaujančiųjų tarptautiniuose mainuose skaičius galėtų būti didinamas organizuojant praktiką užsienio mokslinių tyrimų institutuose arba įmonėse pagal programą *Erasmus*.
6. Socialiniai partneriai turėtų nuolat dalyvauti magistrantūros studijų programos *Mechanikos inžinerija* tobulinimo procese, ir šį dalyvavimą reikėtų labiau formalizuoti.

<...>

Paslaugos teikėjas patvirtina, jog yra susipažinęs su Lietuvos Respublikos baudžiamojo kodekso 235 straipsnio, numatančio atsakomybę už melagingą ar žinomai neteisingai atliktą vertimą, reikalavimais.

Vertėjos rekvizitai (vardas, pavardė, parašas)