STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

# PRODUCTION and MANUFACTURING ENGINEERING FIELD OF STUDY

## Vytautas Magnus University

### EXTERNAL EVALUATION REPORT

**Expert panel:**

1. Panel chair: Prof. dr. Gita Revalde …….. (signature)
2. Academic member: Prof. Dr. Brian Vejrum Wæhrens;
3. Academic member: Prof. Dr. Tauno Otto;
4. Social partner representative: Mr Audrius Jasėnas;
5. Student representative: Mr Džiugas Vyšniauskas

**SKVC coordinator**: Dr. Ona Šakaliene

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# CONTENTS

# I. INTRODUCTION

## 1.1. OUTLINE OF THE EVALUATION PROCESS

The field of study evaluations in Lithuanian higher education institutions (HEIs) are based on the following:

- Procedure for the External Evaluation and Accreditation of Studies, Evaluation Areas and Indicators, approved by the Minister of Education, Science, and Sport;
- Methodology of External Evaluation of Study Fields approved by the Director of the Centre for Quality Assessment in Higher Education (SKVC);
- Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG).

The evaluation is intended to support HEIs in continuous enhancement of their study process and to inform the public about the quality of programmes within the field of study.

The object of the evaluation is all programmes within a specific field of study. A separate assessment is given for each study cycle.

The evaluation process consists of the following main steps: 1) Self-evaluation and production of a self-evaluation report (SER) prepared by an HEI; 2) A site visit by the review panel to the HEI; 3) The external evaluation report (EER) production by the review panel; 4) EER review by the HEI; 5) EER review by the Study Evaluation Committee; 6) Accreditation decision taken by SKVC; 7) Appeal procedure (if initiated by the HEI); 8) Follow-up activities, which include the production of a Progress Report on Recommendations Implementation by the HEI.

The main outcome of the evaluation process is the EER prepared by the review panel. The HEI is forwarded the draft EER for feedback on any factual mistakes. The draft report is then subject to approval by the external Study Evaluation Committee, operating under SKVC. Once approved, the EER serves as the basis for an accreditation decision. If an HEI disagrees with the outcome of the evaluation, it can file an appeal. On the basis of the approved EER, SKVC takes one of the following accreditation decisions:

- **Accreditation granted for 7 years** if all evaluation areas are evaluated as exceptional (5 points), very good (4 points), or good (3 points).
- **Accreditation granted for 3 years** if at least one evaluation area is evaluated as satisfactory (2 points).
- **Not accredited** if at least one evaluation area is evaluated as unsatisfactory (1 point).

If the field of study and cycle were **previously accredited for 3 years**, the re-evaluation of the field of study and cycle is initiated no earlier than after 2 years. After the re-evaluation of the field of study and cycle, SKVC takes one of the following decisions regarding the accreditation of the field of study and cycle:

- To be accredited for the remaining term until the next evaluation of the field of study and cycle, but no longer than 4 years, if all evaluation areas are evaluated as exceptional (5 points), very good (4 points) or good (3 points).

- To not be accredited, if at least one evaluation area is evaluated as satisfactory (2 points) or unsatisfactory (1 point).

## 1.2. REVIEW PANEL

The review panel was appointed in accordance with the Reviewer Selection Procedure as approved by the Director of SKVC.

The composition of the review panel was as follows:

1. Panel chair: Prof. Dr. Gita Revalde, professor at the Riga Technical University Institute of Technical Physics, Latvia;
2. Academic member: Prof. Dr. Brian Vejrum Wæhrens, professor at the Aalborg University Department of Materials and Production, Denmark;
3. Academic member: Prof. Dr. Tauno Otto, professor at Tallinn University of Technology School of Engineering Department of Mechanical and Industrial Engineering, Estonia;
4. Social partner representative: Mr Audrius Jasėnas, Director of the Public enterprise ,,Intechcentras", Lithuania;
5. Student representative: Mr Džiugas Vyšniauskas Second-year master's student of the life and chemical physics program of Vilnius University's Faculty of Physics, Lithuania.

### 1.3. SITE VISIT

The site visit was organised on 19th of November 2024 onsite.

Meetings with the following members of the staff and stakeholders took place during the site visit:

- Senior management and administrative staff of the faculty(ies);
- Team responsible for preparation of the SER;
- Teaching staff;
- Students;
- Alumni and social stakeholders including employers.

There was a need for translation during the meeting with the administration, SER group and teaching staff.

## 1.4. BACKGROUND OF THE REVIEW

### Overview of the HEI

Vytautas Magnus University (VMU or university) was established in 1922 and re-established in 1989. In 2018, Aleksandras Stulginskis University (ASU) and the Lithuanian University of Education (LEU) were reorganized and merged with Vytautas Magnus University. Since 2019, Aleksandras Stulginskis University has operated as the VMU Agricultural Academy.

Today, the Agricultural Academy (AA) is one of the 14 academic divisions of VMU, alongside the Faculty of Arts, Faculty of Catholic Theology, Faculty of Economics and Management, Faculty of Humanities, Faculty of Informatics, Faculty of Law, Faculty of Natural Sciences, Faculty of Political Science and Diplomacy, Faculty of Social Sciences, Education Academy, Music Academy, Institute of Foreign Languages, and the Botanical Garden.

### Overview of the study field

The Agricultural Academy is the historical successor to the traditions of the Faculty of Agricultural Engineering, which was established in 1946 at the Lithuanian Academy of Agriculture. The vision of the Agriculture Academy is to become a strong university school of agricultural sciences in the Baltic region operating on the level of the world's top universities and serving its own country as well as sustainable global development.

The master study programme (SP) Agricultural Engineering and Management, only one programme in the study field of Production Engineering is operated by the Faculty of Engineering at the VMU Agricultural Academy. Additionally, teachers from the Faculty of Bioeconomy Development contribute to the delivery of courses within the programme. In addition to the *Production Engineering* programme, the Faculty also offers postgraduate studies in the fields of *Energy Engineering*, *Mechanical Engineering*, and *Construction Engineering*. The primary research areas of the Faculty include *Biomass Engineering*, *Smart Land and Water Engineering*, *Sustainable Land, Forest, and Water Technologies*, *Tillage and Precision Agriculture Systems*, as well as *Technology Safety and the Sustainable Use of Resources*.

### Previous external evaluations

During the last external evaluation in 2016, the SP was evaluated in the field of General Engineering. However, after the Minister of Education, Science and Sports updated the classification of studies, the field of general engineering was excluded from the classification and therefore the SP was re-registered into the Production engineering study field. In 2016, the external evaluation of the SP was carried out by an international group of experts, who suggested 5 recommendations in the evaluation report.

Concerning the study aims, outcomes and content, it was recommended that students be provided with more flexibility in their study programmes by increasing the number of elective courses. This would allow students to tailor their education to their specific academic and professional interests while ensuring a clearer distinction between mandatory and elective components of the curriculum. In response to this recommendation, the university adjusted the study programme to include three

optional courses, totaling 18 ECTS in Semester 3. Additionally, the program offers students the flexibility to independently select 66 ECTS credits out of total 120 ECTS. This includes credits for Research Work 1, 2, and 3, as well as the Final Work, which are counted as part of the elective credits. However, aside from these, the program includes three optional courses to meet the recommendation for increased student choice.

## Documents and information used in the review

The following documents and/or information have been requested/provided by the HEI before or during the site visit:

- *Self-evaluation report and its annexes*
- *Final theses*
- *Protocols from committee meetings related to the "Agricultural Engineering and Management" study program at VMU*
- *Outlines the progression of the "Research Work" courses within the Master's programme in Agricultural Engineering and Management.*
- *Study course descriptions for Research work 1, 2, 3.*

Additional sources of information used by the review panel:

The following additional sources of information have been used by the review panel:

Home page, excursions in laboratories.

# II. STUDY PROGRAMMES IN THE FIELD

## Second cycle/LTQF 7

| | |
|---|---|
| Title of the study programme | **Agricultural Engineering and Management** |
| State code | 6211EX026 |
| Type of study (college/university) | University |
| Mode of study (full time/part time) and nominal duration (in years) | Second cycle/Full time (2) |
| Workload in ECTS | 120 |
| Award (degree and/or professional qualification) | Master of Engineering science |
| Language of instruction | Lithuanian |
| Admission requirements | Bachelor‘s degree |
| First registration date | 16-05-1997 |
| Comments (including remarks on joint or interdisciplinary nature of the programme, mode of provision) | |

# III. ASSESSMENT IN POINTS BY CYCLE AND EVALUATION AREAS

The **second cycle** of the production and manufacturing engineering field of study is given a **positive** evaluation.

| No. | Evaluation Area | Evaluation points |
|---|---|---|
| 1. | Study aims, learning outcomes and curriculum | 2 |
| 2. | Links between scientific (or artistic) research and higher education | 3 |
| 3. | Student admission and support | 3 |
| 4. | Teaching and learning, student assessment, and graduate employment | 4 |
| 5. | Teaching staff | 3 |
| 6. | Learning facilities and resources | 3 |
| 7. | Quality assurance and public information | 4 |
| | **Total:** | 22 |

# IV. STUDY FIELD ANALYSIS

## AREA 1: STUDY AIMS, LEARNING OUTCOMES AND CURRICULUM

| | |
|---|---|
| 1.1. | Programmes are aligned with the country's economic and societal needs and the strategy of the HEI |

**FACTUAL SITUATION**

### 1.1.1. Programme aims and learning outcomes are aligned with the needs of the society and/or the labour market

The Production and Manufacturing Engineering field of study has a single study programme (SP), Agricultural Engineering and Management. It has a clear agricultural focus, with subjects related to agricultural production, and is designed to educate engineering profile professionals with special competencies.

These programme competencies meet the labor market needs specified above, with the following key competencies acquired: production, management, environmental, and quality. Businesses have expressed the wish for a higher focus on economic computation in the SP, especially in final student theses, as well as a stronger emphasis on managerial and technological innovation in manufacturing.

The very programme is needed as there are approximately 20 companies in the Kaunas region alone interested in employing the alumni. As of today, the number of graduate master's students is optimal. In the future, this programme could be international.

The programme alumni discuss real business challenges in their final theses and address business-specific problems. The programme is also unique, as all graduates are required to present their final theses at conferences.

### 1.1.2. Programme aims and learning outcomes are aligned with the HEI's mission, goals, and strategy

The objectives of the SP are in line with the mission, vision, strategic objectives and strategic areas of both the University and the Academy of Agriculture (AA).

Both the field of study and the SP are designed to address agricultural production issues by educating professionals capable of applying technical innovations aimed at developing sustainable agricultural production processes at a high technical level.

The SP is designed to achieve part of the AA's strategic goals related to the training of specialists to solve the problems of agricultural production through technical innovations aimed at creating high-technical and sustainable agricultural production processes.

The field of study directly correlates with Lithuania's SMART specialization strategy and R&D areas.

The vision of the field of study that describes how it is envisioned in six or seven years, and what measurable KPIs should preferably be achieved, is not available.

## ANALYSIS AND CONCLUSION (regarding 1.1.)

The expert team was pleasantly surprised by the information obtained in discussions with the administration regarding regular and systematic cooperation and consultations with the industry at both the top management and faculty levels. Likewise, in discussions with industry representatives, the commission was convinced that systematic cooperation is working well and that companies' proposals for improving the study programme have been heard.

As a drawback, it could be mentioned that it could be advisable to foster cooperation with manufacturing companies.

During a meeting with teaching staff, students, and alumni, doubts were raised regarding the accuracy of the focus and positioning of the SP, as well as the correspondence of its title to the programme's content. When asked to identify the main distinction of the programme compared to similar SPs - or its primary goal - representatives from the teaching staff and students highlighted management skills. However, management-specific courses that provide master's-level competencies within this programme appear to be underrepresented or even absent. For instance, there is a lack of management engineering (eg. production planning and control; operations design & development; operations/supply chain management).

The title and content of the programme should be consistent and accurately reflect each other. While the programme is widely recognized as essential, its creators need to conduct extensive consultations with stakeholders and partners to identify current needs and restructure the programme accordingly.

| | |
|---|---|
| 1.2. | Programmes comply with legal requirements, while curriculum design, curriculum, teaching/learning and assessment methods enable students to achieve study aims and learning outcomes |

## FACTUAL SITUATION

### 1.2.1. Programmes comply with legal requirements

The structure of the SP adheres to all applicable legal regulations and requirements. These include the total scope of the programme (120 ECTS), the allocation of study field courses (108 ECTS), the volume of the final thesis (30 ECTS), and the balance between contact hours and independent work (10% and 50%, respectively).

Research work is structured over the first three semesters to support Final work preparation. Research Work 1 involves selecting a thesis topic and conducting a literature review; Research Work 2 focuses on familiarization with research equipment; and Research Work 3 is for initial research and data collection. The Final work includes 780 hours (30 credits) for conducting research, analyzing data, drawing conclusions, and presenting the work. According to SER preparation group or programme staff this allocation of hours ensures students achieve the intended learning outcomes

### 1.2.2. Programme aims, learning outcomes, teaching/learning and assessment methods are aligned

The learning outcomes of the SP are formulated according to the aim of SP and include all components of the aim. The outcomes of the study courses are compatible with the outcomes of the SP, however, the evaluators' insights regarding "Precision Farming" as a potential signature topic highlight significant gaps in integrating this theme as a central element throughout the programme. While some courses and final thesis touch on aspects of precision agriculture (e.g., Precision Agriculture Technologies, research on drones for crop spraying), the curriculum lacks progression towards a systems-level understanding of Precision Farming. Courses such as Agricultural Production Technologies and Environmental Engineering should integrate more clearly how these topics relate to Precision Farming systems and ecosystem integration. The evaluators noted an absence of facilities and projects focused on integrating multiple technologies and systems into a cohesive Precision Farming ecosystem.

### 1.2.3. Curriculum ensures consistent development of student competences

Study outcomes are aligned with competence. The programme promote the analysis of contemporary issues as environmental impact and sustainable technologies, evident in the topics of final theses and research assignments. Research projects are incorporated throughout the semesters, enabling students to progressively develop their final thesis. This includes selecting a topic, conducting a literature review, performing experiments, and compiling results. The university maintains ties with industry stakeholders, ensuring that students acquire competences that match labor market demands. Employers provide input on necessary skills, which informs curriculum updates. The curriculum is structured across four semesters, progressing from base knowledge in Semester I (as Methodology of Scientific Research, Measurements in Biosystem Engineering) to applied skills in Semesters II and III

(as Total Quality Management, Business Project Management, Research Work) and culminating in the Final Thesis in Semester IV.

In the meetings with VMU staff, students, and alumni, discussing the topic of the programme "signature" or main focus, it was found that it is difficult to discern from the programme, but it was proposed that "Precision Farming" is one of the main subjects. If this is the case there needs to be a stronger idea about the progression toward Precision Farming, which includes not only the individual pieces of equipment but to a much larger extent the management and systems integration of the entire ecosystem, where multiple technologies, systems, processes and pieces of equipment enable "precision farming". This idea was not found in the curriculum, in labs, or in research agendas. Other recommendations from employers included improving technical English skills, the need for productivity enhancement technologies (lean, precision agriculture), and more future-oriented course projects. At the same time, it was pointed out that some courses in the curriculum are overexposed and there is room for improvement.

### 1.2.4. Opportunities for students to personalize curriculum according to their personal learning goals and intended learning outcomes are ensured

VMU offers students the opportunity to design their own individual study plans in line with the principles of liberal arts education. This approach allows students to acquire additional knowledge and skills tailored to their academic and professional goals. The organization of individual studies is governed by the Order on the Organization of Individual Studies and the VMU Study Regulations.

In Semester 3, students are required to choose three optional courses, amounting to 18 ECTS. Within the 120 ECTS study programme, students have the flexibility to independently select 66 ECTS credits. Interestingly, the university also counts the credits for Research Work 1, 2, and 3, as well as the Final Work, as part of the elective credits. Excluding these, the SP includes only three elective courses. The credits for Research Work 1, 2, and 3, and Final Work were taken into account in elective course percentage as a response to the recommendations of previous accreditation experts to increase the electives percentage.

### 1.2.5. Final theses (applied projects) comply with the requirements for the field and cycle

The content of the final theses is directly aligned with the specific field descriptors, which outline the necessary skills, knowledge, and competencies that should be demonstrated in the field of study. The topics of the theses are closely tied to the core areas of production engineering, including sustainable practices, environmental management, and technological efficiencies like from examples presented in "Noise Emissions and Environmental Noise Prediction from Technological Processes in Livestock Farm", "Evaluation of Energy Efficiency of Cereals and Their Waste", "Impact of Strip-Tillage and Direct Sowing Processes on Soil, Environment, and Winter Wheat". Students are provided with comprehensive guidelines that outline the process for selecting a topic, conducting research, and writing the thesis. While some theses address elements of Precision Farming (as "Application of Drones for Spraying Corn Crops"), the focus is often limited to single technologies rather than systems-level challenges.

## ANALYSIS AND CONCLUSION (regarding 1.2.)

In general, the structure of the SP adheres to all applicable legal regulations and requirements. However, during discussions with the academic staff, issues were raised regarding the

implementation of the Research Work 1, 2, and 3 courses. The expert panel was informed that students select their master's thesis topic upon admission. In the first year, students conduct a literature review as part of this course, worth 6 ECTS. In the second year, they outline the research methods, also worth 6 ECTS. Finally, in the last year, they are developing the master's thesis itself, which accounts for 30 ECTS. In the course descriptions of Research Work 1 and Research Work 2, it is mentioned that they are presented as consisting of chapters of the Master's paper. Given that the development of the final thesis, namely the Master paper, must inherently include both a literature review and a description of the methods, as well as experiments, there is a possibility that credit points might be counted twice. Since the final thesis is a critical component of the study process, questions were raised during discussions about the current approach to its implementation.

Considering that the final thesis is a key element of the academic process, it was noted that the current situation needs attention and the implementation of the Research work 1,2,3, must be reviewed.

## AREA 1: CONCLUSIONS

| AREA 1 | Unsatisfactory - 1<br>Does not meet the requirements | Satisfactory - 2<br>Meets the requirements, but there are substantial shortcomings to be eliminated | Good - 3<br>Meets the requirements, but there are shortcomings to be eliminated | Very good - 4<br>Very well nationally and internationally without any shortcomings | Exceptional - 5<br>Exceptionally well nationally and internationally without any shortcomings |
|---|---|---|---|---|---|
| Second cycle | | X | | | |

### COMMENDATIONS

1. Systematic cooperation with the stakeholders from agricultural sector at both levels, administration and faculty.
2. Obvious need for study programmes in this field.

### RECOMMENDATIONS

To address shortcomings

1. Research work 1,2,3 should be rearranged to avoid transferring credits from the first and second year to the final thesis. It is recommended to consider whether to devote these research works to different topics and allow the topic of the master's thesis to be chosen later, after a wider acquaintance with potential research directions, in cooperation with various companies.
2. The content of the study programme does not fully align with its title. It is recommended to consult with stakeholders to review the programme's content. If the focus remains on management, consideration should be given to enhancing the curriculum with additional courses that support this emphasis. The curriculum should be supplemented

with relevant courses that provide master 's-level skills and knowledge tailored to the industry's needs in management.
3. A study subject for automation and data analysis should be established to strengthen the management engineering discipline of the study.
4. The programme curriculum should be more responsive to the expectations of businesses/employers, with more modules specific to manufacturing, such as managerial and technological innovation in manufacturing (Industry 4.0/5.0, Lean, Agile, etc.).

For further improvement

1. It is suggested to evaluate the potential benefits of replacing Research Work 1 and Research Work 2 with practical placements in various enterprises. This adjustment could provide students with hands-on experience, enhance their understanding of real-world industry practices, and strengthen their practical skills. Additionally, it would address the expressed desire of students and alumni to receive more practical training, thereby aligning the programme more closely with their expectations and career aspirations.
2. Student enrolments are declining, and an action plan would be needed to demonstrate how optimum numbers of graduates produced are ensured in the future.
3. It is suggested that the vision of the field of study be developed, outlining how it is envisioned in six or seven years, the goals that should preferably be achieved, and the tasks that must be completed.
4. If Precision Farming is proposed as a primary focus within the study programme, it should be further developed to encompass not only individual pieces of equipment but also, more importantly, the management and integration of the entire ecosystem. This approach should highlight how multiple technologies, systems, processes, and equipment collectively enable the concept of "precision farming."

# AREA 2: LINKS BETWEEN SCIENTIFIC (OR ARTISTIC) RESEARCH AND HIGHER EDUCATION

| | |
|---|---|
| 2.1. | Higher education integrates the latest developments in scientific (or artistic) research and technology and enables students to develop skills for scientific (or artistic) research |

## FACTUAL SITUATION

### 2.1.1. Research within the field of study is at a sufficient level

The teaching staff involved in the SP are actively engaged in research in areas such as sustainable agricultural engineering, environmental management, and energy-efficient technologies. VMU encourages applied research, particularly in areas like agricultural production and environmental engineering, which directly address labor market needs and societal challenges. Student theses tackle real-world problems such as energy efficiency in agriculture or reducing ammonia emissions. VMU has prioritized investment in research facilities and laboratories in the "Nemunas Valley" science center. While the programme

adheres to legal and academic standards, its potential signature topic of Precision Farming lacks strong representation in the curriculum and in lab infrastructure.

### 2.1.2. Curriculum is linked to the latest developments in science, art, and technology

Faculty members actively contribute to research in areas like biofuel development, energy efficiency, and sustainable farming technologies, ensuring that course content reflects the latest scientific findings. The programme integrates knowledge from various engineering domains, such as renewable energy, agricultural technologies, and environmental sustainability, reflecting interdisciplinary advancements in production engineering. The university collaborates closely with industry stakeholders to incorporate practical applications and emerging industry trends into its programmes. Courses "Environmental Engineering and Management" and "Precision Agriculture Technologies" reflect technological advancements in the agricultural sector. The curriculum includes elective courses that allow students to explore new fields and technologies as "Biomass Production Engineering" and "Environmental Vibroacoustic Processes". However, the integration of cutting-edge technologies, such as IoT, big data analytics, and AI, remains limited. While the SP shows potential, its alignment with emerging trends in science and technology requires further enhancement to fully prepare students for modern industry and research challenges.

### 2.1.3. Opportunities for students to engage in research are consistent with the cycle

Students benefit from access to modern labs and equipment for biosystems measurements, noise modeling, and renewable energy experiments. Many courses include research-oriented projects where students solve real-world problems, enhancing their research and analytical skills. Examples include precision agriculture, sustainability studies, and environmental engineering projects. Research outcomes are intended for presentation and publication, aligning with the expectations of Master's-level studies. Students are encouraged to present their findings at academic conferences and publish in peer-reviewed journals. VMU provides grants and access to resources for student-led research projects. This includes funding for travel to conferences, publishing papers, and procuring necessary research materials. Students have the flexibility to align their research projects with their chosen specialization, supported by experienced faculty members actively engaged in relevant research areas like precision agriculture, sustainable engineering, and environmental management. However, while these opportunities foster foundational and applied research skills, there is a need for greater emphasis on interdisciplinary collaboration, systems integration, and the use of advanced technologies, such as IoT and AI, to enhance the relevance of research outcomes to modern industry challenges.

## ANALYSIS AND CONCLUSION (regarding 2.1.)

The evaluators noticed a disconnect between students and the laboratory facilities, as the labs were underutilized regarding the students' regular learning and research activities. While the labs were presented as an integral part of the programme, it was evident that students were unfamiliar with the equipment, often as marketing donations, indicating limited practical engagement. Apart from some examples, such as learning to fly drones, the connection between laboratory resources and the students' research or curriculum objectives appeared weak. This raises concerns about the integration of hands-on experience with theoretical and

applied aspects of the programme, especially in preparing students for advanced, system-level challenges in Precision Farming. Strengthening this link by embedding regular lab work into the curriculum and fostering active use of laboratory facilities for research and coursework would be essential to ensure students are equipped with the practical skills and confidence to succeed in their field. Also the system that requires students to choose a research topic for their master's thesis immediately upon entering the programme, without first gaining a deeper understanding of current research directions in the field, may hinder the development of more modern research areas.

## AREA 2: CONCLUSIONS

| AREA 2 | Unsatisfactory - 1<br>Does not meet the requirements | Satisfactory - 2<br>Meets the requirements, but there are substantial shortcomings to be eliminated | Good - 3<br>Meets the requirements, but there are shortcomings to be eliminated | Very good - 4<br>Very well nationally and internationally without any shortcomings | Exceptional - 5<br>Exceptionally well nationally and internationally without any shortcomings |
|---|---|---|---|---|---|
| **Second cycle** | | | x | | |

### COMMENDATIONS

1. The curriculum addresses globally relevant topics such as sustainability, renewable energy, environmental impact modeling, and precision agriculture, keeping the programme aligned with cutting-edge developments in science and technology.
2. Opportunities for industry collaboration, such as projects with Baltic Agro Machinery, provide students with practical insights and applications of their research.

### RECOMMENDATIONS

#### To address shortcomings

1. It is recommended to strengthen this link by incorporating regular lab work into the curriculum and encouraging the active use of laboratory facilities for research and coursework.

#### For further improvement

1. Upgrade labs to include cutting-edge technologies like IoT systems, drones, AI tools, and data analytics platforms relevant to Precision Farming.
2. Modernizing tools for experimental and fieldwork, especially in areas like renewable energy and environmental impact modeling, will improve research quality.
3. Develop courses or research opportunities that more explicitly integrate principles from complementary fields such as artificial intelligence, data analytics, and biotechnology.
4. Include modules on emerging areas like circular economy, Industry 4.0, and climate-smart agricultural technologies.

# AREA 3: STUDENT ADMISSION AND SUPPORT

| 3.1. | Student selection and admission is in line with the learning outcomes |
|---|---|

## FACTUAL SITUATION

### 3.1.1. Student selection and admission criteria and procedures are adequate and transparent

VMU has a structured and transparent approach in the selection and admission of students for the Master's SP in production engineering. The programme mainly attracts students from other universities and colleges (80%), and the remaining students come from VMU programmes. The programme has seen a slight decrease in applications, however, there are no sudden drops in the admission scores which are between 8 and 9. During the admission years of 2020-2021, the annual number of applicants was about 35, during the admission years 2022-2023, the annual number of applicants dropped to approximately 24. Despite that, the percentage of signed contracts stayed the same at ~50%.

VMU admission procedures are publicly available on the university's website, printed materials, fairs, and social media platforms. Information reaches potential students directly through consultations and targeted marketing to colleges and employers. Applicants must have a bachelor's degree in engineering or technology sciences. Supplementary studies are offered to applicants from another discipline or college-level education to close the knowledge gap. Admission criteria include competitive score calculation based on academic performance, with special weighting of grades and theses.

### 3.1.2. Recognition of foreign qualifications, periods of study, and prior learning (established provisions and procedures)

VMU has in place policies of recognition of qualifications and competences obtained in foreign education, partial studies and informal learning. Recognition of foreign qualifications is managed centrally by the International Cooperation Department in accordance with Lithuanian regulations and the internal rules of VMU. This mainly contains qualification assessments and regular updating of admission rules for international students and students with foreign acquired education. Decisions are based on information provided by the Centre for Quality Assessment in Higher Education and having consulted VMU faculty members. VMU provides financial support - grants of 500 EUR for students and 1000 EUR for academic staff members for internationalisation. Most of students are employed already during the study period and are not motivated to benefit from Erasmus+ exchange possibilities.

In case the studies were carried out without pre-approved plans, a detailed comparison of the course descriptions and learning outcomes determines their compatibility with VMU programs. However, no more than 75% of a programme can be validated and final theses or exams are excluded from recognition. For competences acquired non-formally, VMU applies internal instructions for validation of learning from professional, voluntary, or personal activities. While such recognition is in line with study programmes or separate courses, there were no recorded cases of crediting partial studies or informal/non-formal competences in the field of production engineering throughout the period under review.

## ANALYSIS AND CONCLUSION (regarding 3.1.)

VMU has a clear and transparent system of student selection and admission to its master's in production engineering. Most students are enrolled from other institutions (80%) and admission scores are stable (8–9), although there is a slight decrease in applications. The admission requirements are a bachelor's degree in engineering or technology sciences, supplemented by courses for students from other disciplines. The International Cooperation Department ensures the following of the Lithuanian regulations and the internal policies for the recognition of foreign qualifications, partial studies, and informal learning. They check the compatibility of the programme with VMU programmes, however not more than 75% of a programme can be credited. This excludes theses and final exams. Although VMU has guidelines for the recognition of non-formal learning, there were no such cases in production engineering during the review period.

| | |
|---|---|
| 3.2. | There is an effective student support system enabling students to maximise their learning progress |

## FACTUAL SITUATION

### 3.2.1. Opportunities for student academic mobility are ensured

VMU offers a selection of opportunities for student academic mobility, with a focus on the Erasmus+ programs. Students can study for a semester or a full academic year at one of the 440 EU or EEA partner institutions, as well as at 118 institutions outside the EU. VMU also offers Erasmus+ internships from 2 to 12 months. Graduate students may participate within a year of graduation. Recently, the university has added more mobility options with very short-term (5–30 days) study and practice programmes and this has seen some interest from the students. When meeting with student representatives the evaluators were convinced that about 90% of students are provided supportive scholarships.

Further, students can participate in exchange programmes with partner universities outside the EU, internships with companies outside the EU, and short-term courses abroad with VMU mobility scholarships. Information on these opportunities is spread through the International Cooperation Department, faculty coordinators, and social media. The criteria for the selection of mobility programmes include learning achievements, language proficiency, and motivation. However, mobility among students in this SP has been very limited, mainly because of personal commitments such as work and family. Although VMU accepts visiting international students, most of them attend specific courses rather than the full-time SPs.

### 3.2.2. Academic, financial, social, psychological, and personal support provided to students is relevant, adequate, and effective

In general, VMU provides academic, financial, social, psychological, and personal support for students. For the academic part, every essential information is given on various platforms like Moodle, e-mail, and through a student portal. Furthermore, with frequent consultation from professors, students receive constant advice on how studies or particular assignments are going.

Students also get help with finances, it includes fee reductions, deferrals of tuition fees, and reimbursement related to participation in scientific events, and conferences. Social support is

provided by the Student Affairs Department. This includes accommodation in university dormitories, social and motivational scholarships, and special scholarships according to academic performance and social situation.

Psychological support is ensured through free counselling at the VMU Psychology Clinics. The university supports students with disabilities through specialized coordinators. The Career Centre offers career planning seminars and links students with job opportunities through its alumni and industry partners.

### 3.2.3. Higher education information and student counselling are sufficient

VMU has a structured approach to delivering information about the study process and providing student counselling. Information is mainly communicated through personal consultations (in person, via email, or phone), virtual meetings, and a dedicated "Information Week" for prospective master's students. Students also have access to detailed study course descriptions on the VMU website and Moodle platform, which include aims, learning outcomes, assessment methods, and required literature. The university provides personalized communication through student emails and a dedicated student portal (studentas.vdu.lt), while general information is also available on social media platforms like Facebook and the university's website. The Student Affairs Department regularly offers counselling on accommodation, scholarships, career services, and other questions.

The Department of Agricultural Engineering and Safety supports students in the study process of production engineering through regular meetings between study coordinators, programme heads, and deans to achieve constant improvement in study organization. Teachers also dedicate 20 academic hours per semester to counselling.

## ANALYSIS AND CONCLUSION (regarding 3.2.)

VMU allows a choice of student academic mobility options. In particular, through Erasmus+, studying or practicing in more than 550 institutions worldwide is possible, and options include both long and short-term positions. Personal commitments do not allow many students to take part in this mobility despite efforts taken by VMU to promote the opportunities via the International Cooperation Department and Faculty coordinators. It also provides the students with inclusive academic, financial, social, psychological, and personal support through academic advising, financial aid, scholarships, counselling, and career planning accessible to all. The information on study programmes and student counselling is provided through multi-channel communication: Moodle, student portal, and personal consultation. The continuous improvement in the study process is maintained by the Department of Agricultural Engineering and Safety through regular meetings and with dedicated teacher support.

# AREA 3: CONCLUSIONS

| AREA 3 | Unsatisfactory - 1<br><br>Does not meet the requirements | Satisfactory - 2<br><br>Meets the requirements, | Good - 3<br><br>Meets the requirements, but there are | Very good - 4<br><br>Very well nationally and | Exceptional - 5<br><br>Exceptionally well nationally |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| | | but there are substantial shortcomings to be eliminated | shortcomings to be eliminated | internationally without any shortcomings | and internationally without any shortcomings |
| **Second cycle** | | | X | | |

**COMMENDATIONS**

1. It is welcomed that the administration and lecturers are adaptive to students who live far away from the university campus.

**RECOMMENDATIONS**

To address shortcomings

1. Students should be fully engaged alongside faculty and administration in enhancing and updating the study programme.
2. Student mobility must be promoted to ensure international collaboration and further development of the study programme.

For further improvement

1. Encourage participation in Erasmus+ and provide targeted financial support or dedicated grants to reduce cost barriers.
2. Strengthen Academia - Industry partnerships to offer more internships, apprenticeships, and job placements tailored to production engineering students.

# AREA 4: TEACHING AND LEARNING, STUDENT ASSESSMENT, AND GRADUATE EMPLOYMENT

| 4.1. | Students are prepared for independent professional activity |
|---|---|

**FACTUAL SITUATION**

4.1.1. Teaching and learning address the needs of students and enable them to achieve intended learning outcomes.

The curriculum integrates intended learning outcomes (ILO) into each course, focusing on knowledge acquisition, research skills, and practical application. Each course description outlines specific teaching and assessment methods that align with the ILOs, ensuring that students develop the competencies required for their field of study. The university's relatively liberal education policy allows students to select elective courses that match their interests and career goals. Students are actively involved in research, with mandatory research courses. This flexibility ensures that students, often living in rural areas, can align their education with personal interests and career goals. Practical skills are addressed through laboratory works, research projects, and assignments that are connected to the SP outcomes, such as the ability to apply engineering principles in production and precision farming contexts. However, student engagement in labs and practical applications has been noted as limited.

#### 4.1.2. Access to higher education for socially vulnerable groups and students with individual needs is ensured.

VMU has established a policy "University of Inclusive Opportunities", which aims to improve accessibility for students and staff with disabilities by way of adjustment of study and work conditions. Students from socially vulnerable groups and students with special needs are allowed to follow an individual study schedule regulated by specific procedures. Such students can attend the lectures in a remote or hybrid format. Besides, their study tasks and presentation dates may be changed when needed.

Several social support measures have been put in place, including tuition and dormitory discounts, scholarships, individual counselling, and physical accessibility with parking spaces, accessible buildings, and specially adapted dormitory rooms. The groups granted these rights include orphans, people with disabilities, students from large families, and those from low-income households. Although there were no students with disabilities in the SP being evaluated during the review period, the policy ensures that students from socially vulnerable backgrounds and with special needs have equal access to education and support at VMU.

### ANALYSIS AND CONCLUSION (regarding 4.1.)

VMU has integrated intended learning outcomes into its structure, giving priority to knowledge, and practical implementation. Flexible policies allow students to choose from elective courses that fit the interest of the student in their post-graduation life. Mandatory research projects are necessary for active engagement. Socially vulnerable groups and students with special needs are included in the "University of Inclusive Opportunities" policy, offering remote and hybrid learning opportunities, flexible schedules, and social support measures such as scholarships, counselling, and adapted facilities that ensure equal education opportunities.

| | |
|---|---|
| 4.2. | There is an effective and transparent system for student assessment, progress monitoring, and assuring academic integrity |

### FACTUAL SITUATION

#### 4.2.1. Monitoring of learning progress and feedback to students to promote self-assessment and learning progress planning is systematic

The monitoring of students' learning progress at VMU is governed by the university's Study Regulations and the Procedure for Monitoring Study Processes. This process involves multiple stages, such as assessing first-year students' preparedness, managing course registration, tracking exam participation, and conducting intermediate evaluations. Additionally, the university gathers data through surveys to monitor students' academic progress, social integration, and overall study experience.

Based on such a review, the university undertakes measures to enhance study organization and promote engagement and provides support where necessary in academic, social, financial, and psychological aspects. The faculty members, study administrators, and coordinators monitor the progress of the students with attention in master's programs through the review of student participation, assignments, and assessment activities.

In case of problems, the study administrator or coordinator contacts the students for help. Feedback is given regularly after mid-term exams, final assessments, and assignments. Teachers give individualized feedback through Moodle, email, and consultations. Students are expected to reflect on their own progress and engage in discussion about their learning outcomes.

### 4.2.2. Graduate employability and career are monitored

Alumni surveys show that their general employability percentage is fairly high, as well as the employability percentage fully or partially in line with the acquired profession. Alumni are employed in areas related to the programme objectives, and their positions range from managers, product quality managers, and occupational safety and environmental protection officers to company founders and executives.

VMU actively and systematically collects data on the alumni's employability and tracks their career developments.

Alumni are active in SP committees, and alumni clubs, and actively contribute to improving the curriculum and the SP quality by delivering presentations, lectures and participating in discussions. When meeting with alumni and employers it was underlined, that agricultural systems management and precision farming are the key competencies expected from VMU graduates of this SP. Also, employers pointed out the importance of English language skills for graduates and the need for internationalization, as markets are often abroad.

An annual survey is used to collect data on the number of graduates employed, their number in positions directly or partially related to their studies, their career satisfaction, and their assessment of the university’s contribution to preparing them for the labor market. The monitoring is systematic, and regular and applies various data collection methods comprehensively.

### 4.2.3. Policies to ensure academic integrity, tolerance, and non-discrimination are implemented

The university adheres to strict rules against plagiarism, cheating, and academic misconduct. These are outlined in the VMU’s academic policies and communicated to students during orientation and through course syllabi. Assignments, research papers, and theses undergo rigorous checks for originality using plagiarism-detection software. VMU fosters an inclusive culture through its diverse and international faculty and student body, as well as its multilingual educational approach. The Code of Academic Ethics prohibits plagiarism, cheating, and other violations, supported by anti-plagiarism tools and clear disciplinary procedures. A dedicated ombudsman or equality office is available to address complaints of discrimination or harassment. Regular training sessions are held for students, faculty, and staff to reinforce the importance of ethical conduct, respect for diversity, and adherence to non-discrimination policies.

### 4.2.4. Procedures for submitting and processing appeals and complaints are effective

VMU has outlined its appeal and complaint submission and handling procedures in the VMU Regulations for Submission of Appeals Regarding Evaluation of Learning Outcomes and in the existing VMU Regulations of the Dispute Resolution Commissions. A student may raise appeals over the evaluation of his learning outcomes or breach of examination procedure. The appeal process has a few possible results: the commission can either uphold and then modify the assessment or uphold the appeal without its modification. The commission can also allow the student to retake the test if there were any procedural violations and outright dismiss the appeal. For any issue being outside of its scope, the commission reports to the appropriate administrative officials. Notably, no appeals were raised against examination assessment or final thesis defense during the period under report.

## AREA 4: CONCLUSIONS

| AREA 4 | Unsatisfactory - 1<br>Does not meet the requirements | Satisfactory - 2<br>Meets the requirements, but there are substantial shortcomings to be eliminated | Good - 3<br>Meets the requirements, but there are shortcomings to be eliminated | Very good - 4<br>Very well nationally and internationally without any shortcomings | Exceptional - 5<br>Exceptionally well nationally and internationally without any shortcomings |
|---|---|---|---|---|---|
| Second cycle | | | | x | |

**COMMENDATIONS**

1. VMU places strong emphasis on student-oriented learning enabling active participation and engagement of even students from the countryside to study and combine their studies with agricultural practice.
2. Good infrastructure as a biogas reactor and supportive high-level centers of excellence (bioeconomy, forestry).
3. Successful focus on precision farming and agricultural systems management is attracting students and gives value to employers.

**RECOMMENDATIONS**

To address shortcomings

None

For further improvement

1. Promote students to benefit from the possibilities of Erasmus+ exchange programmes.
2. Motivate academic staff members to enhance their skills abroad.
3. Introduce Micro-Credentials: offer short-term certifications in specialized topics like digital agriculture, climate-smart technologies, and agricultural data analytics to enhance employability.
4. Enhance the integration of practical and systems-level learning in labs and assessments.

# AREA 5: TEACHING STAFF

| | |
|---|---|
| 5.1. | Teaching staff is adequate to achieve learning outcomes |

## FACTUAL SITUATION

### 5.1.1. The number, qualification, and competence (scientific, didactic, professional) of teaching staff is sufficient to achieve learning outcomes

The formal requirements are met with the current number and qualification level composition of staff. The composition of staff is reasonably distributed across different position categories and staff are quite experienced (average 21 years of teaching experience). A rejuvenation of staff has been ongoing in recent years. A smaller number of teaching staff (6 are mentioned in SER) has an elaborate role in the programme and participates in several courses, which is a good means of consistency.

Staff to student ratio is high and most of these are permanent staff. At the physical meeting with the management, it was stated that there is no PhD programme or PhD students enrolled in the domain of the particular education. There is a point system in place which evaluates staff on several dimensions, and which is supported by an incentive scheme.

The competency profile generally seems to be supportive of the programme and staff have participated in relevant research activities and hold professional community responsibilities. However, in the domain of management engineering the competency profile is in need of further strengthening. Both journal publications and conference participation are biased towards agricultural engineering, mechanics, mechatronics and materials, whereas management engineering is underrepresented.

Didactic and professional standards capabilities are developed rather systematically, with teaching staff participating in formal training during the last three years.

English language literacy needs to be further strengthened to develop teaching and to build on international material and inspiration.

## ANALYSIS AND CONCLUSION (regarding 5.1.)

Translation was needed for the meetings with administration, SER team, and teachers, which indicates a rather rudimentary ability to engage in dialogues with international research and teaching environments. The faculty research and educational competency profile needs further strengthening in the domain “management engineering”.

| | |
|---|---|
| 5.2. | Teaching staff is ensured opportunities to develop competences, and they are periodically evaluated |

## FACTUAL SITUATION

### 5.2.1. Opportunities for academic mobility of teaching staff are ensured

VMU offers extensive opportunities for academic staff mobility through partnerships with institutions all over the world and participation in Erasmus+ and similar programs.

Staff engaged in the particular SP have participated in approx. 6-7 visits/year (2022/2023) and more incoming visits from partnership countries have taken place (22 in 2022 and 11 in 2023). Duration of visits is 3-7 days

Additionally, VMU staff can take part in research-related mobility, including internships, conferences, seminars, and collaborative project meetings, with funding options available to cover travel, accommodation, and participation costs. While these visits are often short-term (3-7 days), they foster valuable international exchanges of teaching practices and research advancements. Despite the pandemic-related challenges, VMU has shown an ongoing commitment to enhancing academic mobility, though there are noted areas for improvement, particularly in increasing participation rates further. This is also acknowledged in the SER as an area of improvement.

### 5.2.2. Opportunities for the development of the teaching staff are ensured

VMU supports ongoing professional development through open courses, seminars, and workshops that cater to a broad audience, including farmers, rural organizations, and government entities. This approach ensures that faculty members are continuously updating their skills and knowledge, staying relevant to industry trends and technological advances, and bringing those insights directly into the classroom. Overall, the faculty at VMU is well-qualified to deliver an education that is aligned with the demands of sustainable and modern agricultural management. The active role of faculty in both research and practical applications fosters a learning environment that is responsive to agricultural challenges.

VMU offers comprehensive opportunities for the professional development of its teaching staff, structured around three key competency areas: general skills (such as foreign languages and management), professional skills (including digital, research, and didactic skills), and personal growth (such as time management). VMU encourages at least 20 hours of professional development per year and supports these through the Professional Competence Development Centre, which coordinates training and workshops both at VMU and through partnerships with other Lithuanian and international institutions. From the SER it is reported that staff have had an active engagement in these development opportunities (approx. 35% participation rate/year).

VMU faculty have free access to a variety of on-campus training sessions, with about 8 sessions monthly and a dedicated development month each January. In 2023, for instance, the university offered training in digital transformation and innovative teaching methods through initiatives like the EdTech project and its alliance with Transform4Europe, enhancing digital and pedagogical skills with topics such as digital storytelling, AI in education, and project management. Faculty also have access to Coursera to independently explore additional learning paths and keep course content aligned with the latest global academic trends.

Feedback from staff is used to refine and expand offerings, ensuring that training is aligned with faculty needs and interests as identified through surveys and faculty input.

**ANALYSIS AND CONCLUSION (regarding 5.2.)**

Structured Competency Frameworks: Internationally, universities with strong engineering programmes emphasize structured and tiered professional development for faculty. These frameworks advocate for continual professional growth in three core areas: technical expertise, teaching methodology, and industry-relevant skills. VMU's competency groups (general, professional, and personal) largely match these standards by covering pedagogical training, digital skills, and subject-specific knowledge.

Digital and Didactic Skills: international engineering programs increasingly emphasize digital transformation, active learning, and student-centered teaching. VMU's development programs reflect these trends, offering training on innovative teaching methods and tools, digital competencies, and distance learning. Initiatives such as the EdTech project and access to Coursera help VMU stay current with digital transformation standards seen in competitive engineering schools globally. However, leading institutions often require more intensive and ongoing technology training by mandating annual digital upskilling hours for staff to keep pace with industry standards.

Industry Collaboration and Research Integration: Engineering programs internationally prioritize collaborations with industry and research integration, offering staff opportunities to engage in applied research, internships, and industry partnerships. VMU staff have extensive experience from practice (an average of 15.2 years according to the SER) and offers faculty support through Erasmus+ and Transform4Europe, yet increasing formal industry partnerships and applied research opportunities could enhance real-world relevance in engineering education, particularly as these connections support faculty in aligning their expertise with current industry practices.

Frequency and Customization of Training: While VMU offers a wide variety of training sessions (averaging 8 per month and a dedicated month annually), leading programs often provide even more intensive development schedules, as well as individualized plans based on personal development needs and goals. Customizing faculty development paths can ensure each faculty member's training directly aligns with their teaching and research responsibilities, an approach found in many high-ranking engineering institutions.

In summary, VMU provides a robust foundation for professional development that meets several international standards, particularly in digital competency and pedagogical training. However, to fully match the standards of leading international engineering programs, VMU could benefit from deepening its industry ties, intensifying digital and applied research training, and further personalizing development programs to fit individual faculty goals.

## AREA 5: CONCLUSIONS

| AREA 5 | Unsatisfactory - 1<br>Does not meet the requirements | Satisfactory - 2<br>Meets the requirements, but there are substantial | Good - 3<br>Meets the requirements, but there are shortcomings to be eliminated | Very good - 4<br>Very well nationally and internationally without any shortcomings | Exceptional - 5<br>Exceptionally well nationally and internationally |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| | | shortcomings to be eliminated | | | without any shortcomings |
| **Second cycle** | | | x | | |

**COMMENDATIONS**

1. Opportunities for professional development are provided.
2. In response to the last evaluation process the faculty has initiated a rejuvenation process of the staff.

**RECOMMENDATIONS**

To address shortcomings

1. It is recommended to promote and facilitate increased mobility of academic staff.
2. Strengthening the management engineering professional domain in the faculty.
3. English language skills to be further advanced to enable engagement in international research and teaching development.

For further improvement

1. Implementing systematic and personalized development plans would be highly beneficial. These plans could include setting clear individual goals, providing tailored training opportunities, and offering mentorship or coaching to support personal and professional growth. Such an approach would foster continuous development, enhance job satisfaction, and improve overall performance.
2. Strengthen expertise in management engineering and emerging fields through targeted recruitment and training.
3. It is suggested to continue fostering a sustainable generational shift by attracting more young educators. This can be achieved by maintaining a supportive environment through competitive salaries, professional development opportunities, mentorship programs, career progression pathways, and access to modern teaching resources. Additionally, sustaining an innovative academic culture will further enhance the appeal for young talent.

# AREA 6: LEARNING FACILITIES AND RESOURCES

| | |
|---|---|
| 6.1. | Facilities, informational and financial resources are sufficient and enable achieving learning outcomes |

## FACTUAL SITUATION AND ANALYSIS

### 6.1.1. Facilities, informational and financial resources are adequate and sufficient for an effective learning process

VMU offers a variety of specialized learning facilities that support the Agricultural Engineering and Management programme. These facilities are designed to provide practical, hands-on experience in fields relevant to agricultural engineering, such as crop production, machinery, and environmental sustainability.

Key Facilities:

- Agricultural Research and Development Facilities: VMU has dedicated labs and field research areas where students can work to study crop management, soil science, and sustainable agricultural practices. These resources allow students to engage in applied research and innovation in areas critical to agriculture. Some elements within also support precision farming, but there is no dedicated systematic lab facility supporting precision farming or the agricultural system and management system in which precision farming is embedded (IT/OT, IoT, planning & control).
- Technology-Enhanced Classrooms and Labs: VMU's campus includes classrooms and labs outfitted with some digital tools for precision agriculture, labs also include biosystems, crops engineering, and technology labs, which help students understand agricultural systems and machinery.
- Partnership with Industry and Field Experience: The university has some collaboration with agricultural companies and industry organizations, which provides students access to internships and on-site learning, but most of these are taking their outset in the part-time jobs of students. This exposure enables students to apply classroom knowledge in real-world agricultural settings, which is vital for developing management and engineering skills specific to the sector.
- Digital Resources and Learning Platforms: Many students have part-time work and travel larger distances to reach VMU. Therefore, MVU also supports student learning through access to digital platforms. Students also have access to on-campus dorms.

During the visit to the labs, we saw active research engagement in the lab in domains related to the study. However, it was also clear that these facilities should to a larger extent be designed to equip students in the Agricultural Engineering and Management programme with a balance of technical, practical, and managerial skills, preparing them for the diverse challenges of modern agriculture.

### 6.1.2. There is continuous planning for and upgrading of resources.

During the visit, the expert group saw lab facilities and also proof of an active research & development activity in the labs. However, further modernization of the labs driven by "precision farming" and the system integration that will support the domain (eg., IT and OT integration) is recommended. The SER does provide an account of upgrading and updating of educational resources (p. 42), although this does not specify directly the upgrading of lab facilities apart from computer labs.

## CONCLUSION (regarding 6.1.)

Advance Integration with Industry Partners: While VMU does offer partnerships and internships, the SP could benefit from expanded, formalized collaborations with leading companies in agriculture, engineering, and technology. Stronger ties with industry partners could support students in gaining practical experience and aligning their technical and managerial skills with real-world demands. Leading agricultural programs often have long-term partnerships with equipment manufacturers and large agricultural enterprises to provide students with opportunities for internships, on-site training, and access to current technological trends.

Enhanced Digital Transparency and Data Analytics Resources: Modern agricultural engineering increasingly relies on data transparency, data analytics, remote sensing, and digital tools for monitoring, optimizing, and managing agricultural systems, and “precision farming” represents a sum of these. Expanding digital and analytical resources—such as software for farm management, soil mapping, and crop modeling, would better prepare students for the digitalization of agriculture. Advanced production and management systems, data analysis labs and resources dedicated to agri-tech could also deepen students’ technical skills and align with current trends toward digital transformation in agriculture. This also provides an important avenue for integrating management engineering more directly into the programme.

## AREA 6: CONCLUSIONS

| AREA 6 | Unsatisfactory - 1<br>Does not meet the requirements | Satisfactory - 2<br>Meets the requirements, but there are substantial shortcomings to be eliminated | Good - 3<br>Meets the requirements, but there are shortcomings to be eliminated | Very good - 4<br>Very well nationally and internationally without any shortcomings | Exceptional - 5<br>Exceptionally well nationally and internationally without any shortcomings |
|---|---|---|---|---|---|
| Second cycle | | | x | | |

**COMMENDATIONS**

1. Distant learning and library access opportunities supported.

**RECOMMENDATIONS**

To address shortcomings

1. Advance integration with industry and sector partners.

For further improvement

1. Enhances digital transparency and data analytics resources in lab facilities - to further support the management engineering discipline of the study. Consider demonstrating the modern agricultural system of the future through agricultural technologies and IT integration. Demonstrating the “factory of the future” for agriculture has the potential to modernize the teaching and research environment even further. Precision farming moves beyond the individual piece of equipment and demands a high level of system integration across the whole manufacturing system.
2. Improve laboratory engagement by upgrading labs with cutting-edge technologies such as IoT systems, drones, and AI tools, to cope with modern industry standards and enhance hands-on learning experiences.
3. Develop a Precision Farming and Systems Integration Lab to address emerging industry trends and prepare students for advanced agricultural systems.

# AREA 7: QUALITY ASSURANCE AND PUBLIC INFORMATION

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|---|---|
| 7.1. | The development of the field of study is based on an internal quality assurance system involving all stakeholders and continuous monitoring, transparency and public information |

## FACTUAL SITUATION

### 7.1.1. Internal quality assurance system for the programmes is effective.

The main documents supporting the Quality Assurance (QA) system are listed and made publicly available on the VMU website in both Lithuanian and English. Production Engineering studies at VMU have been significantly improved and formalized through the implementation of an internal QA system, while maintaining the informal and open communication characteristic of VMU's Liberal Arts model and unique institutional culture.

Following the 2019 university merger, necessary changes were made to align the Agricultural Academy's study programs with VMU's Liberal Arts study framework and *VMU Regulation for Quality Studies.* The roles and responsibilities of various bodies within the QA system are clearly defined.

One key body is the Study Programme Committee (SPC), which is primarily responsible for coordinating the program's implementation, addressing curriculum-related matters, and ensuring the program's quality. The Committee for the SP consists of seven members: a chairperson, four teachers, one social partner, and one student.

### 7.1.2. Involvement of stakeholders (students and others) in internal quality assurance is effective

Social partners and employers actively participate in internal quality assurance. Alumni, instructors, and students get surveyed on various subjects. Information on the quality of studies is collected from social partners using various methods during committee activities, discussions, surveys and participation in joint events, such as career days.

The student representation is closely cooperated with, and it uses social media to disseminate and collect information.

To ensure the quality of studies, information on the instruction quality is systematically collected on an annual basis, as well as one on labor market readiness and labor market integration. Annual instructor surveys are systematic, featuring good instructor access to survey outcomes.

### 7.1.3. Information on the programmes, their external evaluation, improvement processes, and outcomes is collected, used and made publicly available

The annual plans for the improvement of the SP, made by the SPC that utilizes evaluation results to plan actions for the SP improvement are available at the homepage of the university https://www.vdu.lt/. SPC is responsible for the implementation of the plans and discusses their progress at meetings twice a year. All plans for the improvement of the programme are coordinated with the faculty and approved by the Faculty Council.

Students, teachers, employers, and graduates actively contribute proposals for the SP renewal through meetings and discussions. Teachers are responsible for course content, teaching quality, and assessment methods, incorporating feedback from students gathered through open discussions and anonymous surveys conducted each semester. These surveys help refine course content and methods, with results discussed during SP committee meetings. The SPC plays a central role in evaluating and updating study programs, advising teachers, and ensuring open participation from all stakeholders. Their decisions are further reviewed by the Dean's Office to ensure proper implementation and alignment with institutional goals.

he summarized results of the analysis of feedback data are presented within 3 months to the social stakeholders who provided their feedback, as well as to other representatives of the university's social stakeholders. The results are published on the VMU website, sent by e-mail to students and teachers, stored in Outlook folders, presented on social networks, and shared through other channels, i.e., information about the quality of studies and measures taken to improve it is published in the annual report on the faculty's activities.

### 7.1.4. Student feedback is collected and analyzed.

VMU is seeking an opinion from the students through questionnaires, which ensure evaluations of different stages of academic travel starting from the first-year experience to post-graduation insights. The stable levels of student satisfaction expressed in the positive feed suggest that the university SP is meeting the educational and practical needs of the students. Such inclusion of both qualitative comments and quantitative survey data gives the university a chance to understand its strengths and areas for improvement on a comprehensive basis.

## ANALYSIS AND CONCLUSION (regarding 7.1.)

There is well-established traditional cooperation with the industry representatives from the agriculture sector. The programme creators and the university administration have a good understanding of the importance of stakeholders in supporting studies, however, the intentions expressed in discussions with the administration about the use of modern infrastructure during internships in companies are currently more in the form of wishes or plans. There should be more specific plans for how master's students can become familiar with and acquire modern infrastructure and equipment on a company basis if the university itself is unable to purchase them.

During discussions with students, it was noted that many feel uncertain about how their proposals and responses to the numerous questionnaires are considered or implemented in decision-making processes.

# AREA 7: CONCLUSIONS

| AREA 7 | Unsatisfactory - 1<br>Does not meet the requirements | Satisfactory - 2<br>Meets the requirements, but there are substantial shortcomings to be eliminated | Good - 3<br>Meets the requirements, but there are shortcomings to be eliminated | Very good - 4<br>Very well nationally and internationally without any shortcomings | Exceptional - 5<br>Exceptionally well nationally and internationally without any shortcomings |
|---|---|---|---|---|---|
| **Second cycle** | | | | X | |

## COMMENDATIONS

1. Well-established traditions of cooperation with stakeholders from the agriculture sector.

## RECOMMENDATIONS

### To address shortcomings

None

### For further improvement

1. To obtain more representative data from surveys, greater emphasis should be placed on engaging in dialogue with students and stakeholders about the significance of the surveys and how their results contribute to improving the quality of studies.
2. The well-established cooperation with the relevant industry partners and stakeholders should include more concrete and focused partnerships, for example, to allow students to use their facilities and equipment during internships, collaborative projects, or specialized training sessions. VMU could organize workshops and hands-on training at industry partner locations, enabling students to work with state-of-the-art tools and technologies used in the field.

# V. SUMMARY

The review panel commends VMU for its well-prepared self-evaluation report and efforts in organizing a constructive site visit. The study programme demonstrates strengths in comprehensive academic and student support, including personalized guidance, financial aid, and psychological services, as well as inclusive policies for students with special needs. It aligns with societal and labor market needs, offering applied research opportunities, internships, and practical learning through biosystems and crop engineering labs. Faculty engage in relevant research and benefit from professional development initiatives like Transform4Europe and Coursera, while transparent admission policies support diverse academic backgrounds. However, Precision Farming, a core focus, requires stronger representation in the curriculum, research, and facilities, particularly in systems integration and advanced technologies such as IoT and AI. The management engineering domain needs further development. Limited student engagement with laboratory resources and not fully targeted internationalization efforts, including mobility and enrollment, highlight areas for growth. The programme would benefit from a long-term strategic vision, enhanced marketing strategies, and better alignment of research with industry trends. While the programme provides a solid foundation in agricultural engineering education, addressing these areas will ensure it meets global competitiveness standards. more visible place in the curriculum and must be supported by inputs from the course portfolio, supplementary sources, and lab facilities to a larger extent than it appears today. This also provides an important pathway for further enhancing the management engineering component which is largely missing from the curriculum. More specifically:

- Management Engineering should be strengthened further in the curriculum, in staff profiles, and research engagements.
- Research engagement suffers from some important flaws in terms of timing, scoping, and engagement with practice/empirical foundation.
- The VMU Production Manufacturing and Engineering field of study has a single study programme, Agricultural Engineering and Management. The very programme is needed as there are approximately 20 companies in the Kaunas region alone interested in employing the alumni. As of today, the number of graduate master's students is optimal. In the future, this programme could be more international. However, it is necessary to prepare a long-term vision for improving the study programme, based on an analysis of labor market needs. It is also important to develop a marketing strategy for promoting the field of study, which directly correlates with the vision mentioned above.
- Student admission and support: the application process is transparent and straightforward to local students, however, there were no international students. Also, the university has shown great efforts for the well-being of students regarding their time during their studies. Even though there are personal one-on-one relationships between the students and lecturers, more efforts should be put in place to ensure a more centralized approach between students and faculty collaboration.

The panel thanks VMU for its dedication and encourages the institution to build on its strengths while addressing the identified improvements.