JOINT REPORT BY THE EXPERTS ON THE INCLUSION OF A LICENSED STUDY PROGRAMME ON THE ACCREDITATION FORM

Latvia University of Life Sciences and Technologies

STUDY FIELD

Architecture and Construction

ACADEMIC MASTER STUDY PROGRAMME

Geoinformatics and Remote Sensing

Experts:

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I. Summary of the Assessment

The study programme was evaluated positively by the experts, who found that it complies with the requirements set forth by the higher education standard. The study programme prepares students well for both academic and professional roles in geoinformatics and remote sensing, offering interdisciplinary learning, advanced research opportunities, and practical skills through partnerships with industry. However, the assessment also highlighted areas needing improvement.

Positive Aspects:

- **Industry Relevance**: The study programme addresses current industry needs and trends, preparing students for roles in geoinformatics and remote sensing, which are in high demand.
- **Technical Resources**: The university provides robust technical infrastructure, including advanced GIS tools, remote sensing equipment, and an upcoming drone laboratory to enhance hands-on learning.
- **Employment Prospects**: Graduates are well-positioned in the job market, particularly in sectors requiring geoinformatics expertise, such as spatial land administration and crisis management.
- **Interdisciplinary Approach**: The study programme successfully integrates theoretical and practical knowledge, providing students with a broad skill set.
- **Collaboration with Industry**: Partnerships with the European Space Agency and other industry entities provide valuable real-world experience for students.

Negative Aspects:

- **Low Student Enrolment**: Despite the relevance of the study programme, enrolment remains low, affecting its visibility and impact.
- **Limited Industry Involvement**: While industry partnerships exist, their involvement in curriculum development and guest lectures is not consistent and requires further formalisation.
- **Financial Challenges for Equipment Updates**: Maintaining up-to-date equipment to align with technological advancements could pose future financial challenges for the university.
- **Student Recruitment and Promotion**: More effort is needed to promote the study programme’s relevance and career pathways to prospective students, especially given the low enrolment numbers.

The **Geoinformatics and Remote Sensing master's programme** is well-aligned with industry needs, offering students valuable technical skills and strong employment prospects. However, there are areas that require improvement, particularly in increasing student enrolment, enhancing industry collaboration, and ensuring continuous financial investment in technical resources. By

addressing these challenges and capitalizing on its existing strengths, the study programme has the potential to become a regional leader in geoinformatics education.

II. Description of the study programme

1. Indicators describing the Study Programme

1.	Name of the higher education institution/college	Latvia University of Life Sciences and Technologies
2.	Name of the study field corresponding to the study programme	Architecture and Construction
3.	Name of the study programme	Geoinformatics and Remote Sensing
4.	Code of the study programme in accordance with the Latvian Education Classification	45581
5.	Language of study programme implementation	Latvian and English
6.	Amount, duration, form and type of the study programme (also distance-learning)	120 CP, 2 years, full time
7.	Admission requirements	Bachelor's degree in agricultural sciences, forestry, transport logistics, land management and surveying, geodesy, landscape architecture, environmental sciences or other natural and engineering sciences. If you have a degree in another field of study, you will need at least 2 years' professional experience in a field related to the specialisation of your chosen Master's degree programme. For studies in English, in addition, a minimum B2 level of English
8.	Address of the study programme implementation, indicating whether the study programme is implemented in the branches of the higher education institution / college	Faculty of Forest and Environmental Sciences, Akadēmijas street 19, Jelgava, LV-3001, Latvia
9.	Degree, professional qualification or degree and professional qualification to be awarded	Master of Engineering in Architecture and Urban Design (Mg.sc.ing.)
10.	Date of study programme licensing	29.06.2022.
11.	Date of starting the implementation of the study programme	01.09.2022.
12.	Accreditation term of the study field	27.10.2028.

Analysis

1. Compliance of the study programme with the study field.

It should be emphasized that the academic master's study programme "Geoinformatics and Remote Sensing" ensures the fulfilment of the goals included in the LBTU strategy as, for example, at a time when the digital world, based on coordinates and accurate images from space, is developing so much - then only high-quality educated and science-oriented graduates make a valuable contribution to the national economy, ensure innovations, that meets future needs and growth requirements. The development of competences, entrepreneurship and creativity necessary for the implementation of the priorities of the Latvian Smart Specialization Strategy. This will contribute to the improvement of the field of science and bringing science to the fore, attracting the best and most motivated students to the study programme. The field of study plays an important role in the overall development of the Latvian economy, as it includes specialisations and fields closely related to sustainable land management, geoinformation and planning, etc. All these aspects are highlighted in a number of international strategies of relevance today, such as the UN General Assembly resolution of 25 September 2015 “Transforming Our World: the 2030 Agenda for Sustainable Development”. It is the first global document to provide for universal and comprehensive action. This resolution sets out 17 well known sustainable development goals. This is reflected in many other United Nations documents, such as the Global Geodetic Observation System (GGOS) documents, which are constantly being improved. These initiatives are also related to the provision of biodiversity, ecosystem services, development of climate-smart solutions (EU Biodiversity Strategy; EU Green Infrastructure Strategy, etc.). Also objective of the Geospatial Information Law (2010) justifies the need to establish an institutional framework in the field of geospatial information, including the conditions for the production, use, exchange and maintenance of geospatial information (including geodetic and cartographic master data) in order to create a geospatial information infrastructure in the Republic of Latvia. Likewise, work continues with the mentioned law, improving a comprehensive concept and framework for future joint work. Similar findings and objectives are also included in the Land Management Law (2015). Detailed descriptions are available on the portal www.likumi.lv.

Experts agree that the new Faculty of Forest and Environmental Sciences of LBTU has historically accumulated many years of experience in the implementation of sub-sectors and study programmes in the field of study "Architecture and construction".

The Geoinformatics and Remote Sensing study programme aligns well with the Architecture and Construction field due to its focus on spatial data analysis, geomatics, and GIS technologies. These are fundamental areas of study within urban planning, infrastructure development, and environmental management, all of which are crucial for the construction and architectural industries. The study programme integrates geospatial technologies and remote sensing applications, ensuring that students are equipped with the skills needed to solve real-world problems related to land use, environmental monitoring, and urban development. The master's study programme builds on this foundation by introducing more complex and interdisciplinary approaches, such as remote sensing for environmental applications and advanced GIS technologies. It also emphasizes research, pushing students to engage with current trends in

spatial analysis and urban planning technologies (LBTU report for the academic master, page 4).

Additionally, the study programme's integration of innovative technologies like 3D modeling, remote sensing tools, and Building Information Modelling (BIM) aligns it with the digitalisation trends seen in both construction and environmental management sectors. This focus on modern technologies ensures that the study programme remains relevant to the national economy and the global industry, which increasingly relies on such digital tools for spatial data management and sustainable planning (LBTU report for the academic master, page 4).

2. Compliance between the title of the study programme, the degree to be awarded and the qualification (if applicable).

The title of the study programme, Geoinformatics and Remote Sensing, clearly reflects its focus on the use of geospatial data for planning, monitoring, and managing natural and built environments. This accurate titling helps to ensure that potential students, employers, and industry stakeholders understand the scope and objectives of the study programme. Upon successful completion, graduates are awarded a Master of Engineering in Architecture and Urban Design, which is appropriate considering the interdisciplinary nature of the study programme. This emphasizes both the technical and applied aspects of geoinformatics and remote sensing within architecture and urban design.

The awarded degree is highly relevant to the study programme's goals, which aim to develop professionals capable of applying advanced spatial data analysis and geospatial technologies to solve real-world problems in fields like urban planning, environmental management, forestry, and transport logistics. The broad skills students acquire enable them to work in various roles, ranging from public sector jobs in land management and surveying to private sector positions in GIS and remote sensing technology.

Moreover, the degree's alignment with Latvian national qualifications frameworks ensures that graduates meet the educational standards required for high-level technical and management positions. It also prepares them for further academic pursuits, such as doctoral studies, in fields like geoinformatics, environmental science, and urban design. The degree title effectively represents the breadth and depth of the study programme's content, providing graduates with both theoretical knowledge and practical skills in line with the expectations of employers in geospatial industries (LBTU report for the academic master, page 4).

3. Compliance of the study programme indicators (study programme code, amount, implementation duration) with the learning outcomes defined for it.

The Geoinformatics and Remote Sensing master's study programme has key indicators that align well with its learning outcomes, ensuring a coherent educational experience. The study programme's study code (45581), 120 CP volume, and two-year full-time duration are consistent with the structure of an academic master's study programme in Latvia, meeting the national standards for higher education. The credit allocation reflects the extensive coursework and independent research that students must complete, allowing them to acquire a

comprehensive skill set in geospatial data analysis, remote sensing technologies, and interdisciplinary problem-solving.

The study programme's learning outcomes are well-defined, focusing on developing students' abilities to independently conduct scientific research, apply state-of-the-art geospatial technologies, and contribute to both academic and professional fields. Students are trained to critically assess and address complex spatial problems, whether related to urban development, land use planning, environmental monitoring, or crisis management. These learning outcomes ensure that graduates can apply their knowledge in practical settings, including municipal planning offices, environmental agencies, and private companies that rely on geospatial data for decision-making.

The study programme's structure includes a master's thesis, which requires students to engage in in-depth research on a topic relevant to geoinformatics or remote sensing. This capstone project allows students to demonstrate their mastery of the subject and their ability to apply theoretical concepts to real-world issues. The study programme also includes specialisation areas such as geospatial information provision for agriculture, forestry, and spatial land administration, which further aligns the learning outcomes with the demands of the industry (LBTU report for the academic master, page 8 and annex 1).

Overall, the study programme's indicators ensure that students achieve a high level of competence in the fields of geoinformatics and remote sensing, preparing them for both professional careers and advanced academic pursuits.

Conclusions, strengths and weaknesses

The Geoinformatics and Remote Sensing master's study programme provides a strong academic and practical foundation for students, aligning well with both national educational standard and industry requirements. The study programme's focus on modern geospatial technologies ensures that students acquire relevant and highly sought-after skills that will enable them to contribute to Latvia's Smart Specialisation Strategy and other international development goals. However, the study programme faces challenges related to student enrolment and sustained industry engagement, which need to be addressed to ensure its long-term success.

Strengths:

1. **Industry-Relevant Curriculum:** The programme's focus on geospatial technologies, such as GIS, remote sensing, and spatial data analysis, directly responds to industry demands. Graduates are equipped with skills that are critical for roles in urban planning, environmental management, forestry, and logistics. This makes them highly employable in sectors where geospatial data plays an essential role in decision-making.
2. **Strong Technical Infrastructure:** LBTU provides students with access to state-of-the-art technologies, including GIS tools, remote sensing equipment, and computer labs

equipped with advanced software for geospatial analysis. The university's investment in technology, such as the GIS Competence Centre and geodetic laboratories, ensures that students can gain hands-on experience with the latest industry tools. This practical exposure enhances their learning and makes them competitive in the job market.

3. **Interdisciplinary Approach:** The programme successfully integrates elements from various fields, including land management, geodesy, environmental science, and crisis management. This interdisciplinary approach broadens students' skillsets, allowing them to apply their knowledge across different sectors and industries. By doing so, it prepares students for a wide range of career opportunities and encourages creative problem-solving.
4. **Alignment with National and International Strategies:** The programme supports both national priorities, such as the Latvian Smart Specialisation Strategy, and international initiatives like the European Green Deal and the UN Sustainable Development Goals (SDGs). This alignment ensures that the programme remains relevant not only within Latvia but also in the global context, making graduates attractive to both local and international employers.

Weaknesses: not indicated

2. Topicality of the study programme

Analysis

1. The topicality of the study programme and the compliance of the content with the tendencies of the industry (area), the changes made since the licensing of the study programme.

The Academic Master study programme “Geoinformatics and Remote Sensing” is well-suited to meet industry demands, preparing students for advanced research and professional roles. For example, graduates have secured positions in sectors such as land surveying, forestry, and urban planning, utilizing their expertise in geospatial data analysis and remote sensing. The increasing demand for geoinformatics specialists in these fields underscores the relevance of the study programme to the industry (LBTU report for the academic master, page 7**).** The study programme integrates interdisciplinary learning with the latest technological advancements, providing students with the skills needed in sectors like agriculture, forestry, and spatial land management. Courses such as “Advanced Remote Sensing” and “Geospatial Information Systems for Environmental Management” offer students practical exposure to tools like LiDAR and satellite imagery analysis, which are critical for these industries (LBTU report for the academic master, page 16). Collaboration with the European Space Agency and partnerships with industry help to keep the study programme aligned with current trends (LBTU report for the academic master, page 9), although these collaborations should be expanded further to provide more practical learning opportunities for students. Since its licensing, the study programme has adapted to technological advances. For instance, new courses focusing on digital

mapping technologies and drone applications in geospatial research have been added to the curriculum, ensuring that students are trained in cutting-edge tools and techniques (LBTU report for the academic master, page 10). However, more could be done to promote the study programme's relevance and career pathways to prospective students.

Regarding the changes made since licensing, it is important to emphasise, that the university transitioned the study programme from Latvian CP to ECTS following the guidelines in the "Law on Higher Education Institutions" (LBTU report for the academic master, page 10). The conversion ensured that 60 CP corresponds to one full academic year in line with ECTS, where each credit point represents the workload required to achieve the study outcomes. The transition did not impact the content of the study programmes; however, some courses saw minor adjustments in their workload hours to match ECTS standards.

2. Dynamics of the student number and prospects of employment for graduates.

Student enrolment for the master's study programme remains low. For example, in 2021, only 3 new students were enrolled, and in 2022, the enrollment was similarly low with 2 new students joining the study programme (LBTU report for the academic master, page 5). Based on the feedback received while interviewing industry representatives, the graduates of the study programme are well-prepared for employment in sectors that demand advanced geoinformatics skills, more structured industry collaborations are needed to provide students with greater access to internships and practical experience. Industry partners on the site visit interviews have expressed interest in supporting the study programme, but their involvement in curriculum development, guest lectures, and excursions needs to be more consistent to ensure students benefit fully from these collaborations.

The study programme would benefit from more effective marketing strategies to raise awareness among prospective students, especially those in related disciplines. More efforts could be made to highlight the study programme's relevance to emerging fields like smart city planning, environmental sustainability, and crisis management. Additionally, the university could explore opportunities to promote the study programme internationally to attract a more diverse student population.

Conclusions, strengths and weaknesses

The study programme is highly relevant to industry needs and prepares students for advanced roles. However, it would benefit from stronger industry collaboration and more consistent student recruitment efforts.

Strengths:

1. The study programme is interdisciplinary and well-suited for advanced research and professional careers in geoinformatics;
2. Industry representatives have shown interest in supporting the study programme, which can strengthen student learning and employment prospects;

3. Graduates are well-positioned for employment due to the high demand for advanced geoinformatics skills.

Weaknesses:

1. Low student enrolment and insufficient marketing efforts to raise awareness of the study programme's relevance to emerging fields such as smart city planning, environmental sustainability, and crisis management.
2. Limited industry involvement in curriculum development, invited lectures, and excursions to companies.

3. Resources and provision

Requirement [R1]: Compliance of the study base, science base (if applicable), information base (including library), material and technical base and financial base with the conditions for the implementation of the study programme and for ensuring the achievement of learning outcomes.

Analysis

The master's study programme is well-supported by a range of technical resources, including advanced GIS tools, remote sensing equipment, and laboratory facilities. The university has made significant investments in updating its technical infrastructure, with the Geodetic Instrument Calibration Laboratory and the upcoming drone laboratory set to further enhance the study programme's practical component (LBTU report for the academic master, page 11). However, maintaining and upgrading equipment to keep pace with technological advancements could pose financial challenges in the future. Collaboration with industry partners could provide additional support by offering access to the latest tools and datasets. Additionally, the university has made continuous improvements to the information and methodological base, providing students with access to numerous online databases, e-learning tools, and up-to-date scientific literature. For example, students have access to databases such as EBSCO and ScienceDirect, as well as specialized geospatial data resources. E-learning tools like Moodle are actively used to support the learning process (LBTU report for the academic master, page 14).

The university's study base includes state-of-the-art GIS software, remote sensing tools, and well-equipped laboratories such as the GIS Competence Centre and Surveying Training Laboratory. These facilities ensure students receive hands-on training in the most up-to-date technologies (LBTU report for the academic master, page 12). The university's library resources are strong, with access to a wide range of digital and printed materials, including scientific journals, geospatial datasets, and technical manuals (LBTU report for the academic master, page 14). However, there is room for further expansion, particularly in specialized fields like remote sensing and digital mapping. The study programme benefits from adequate financial support, with state funding and project grants contributing to the maintenance and improvement of technical infrastructure (LBTU report for the academic master, page 16). However, the

increasing cost of upgrading equipment and staying current with technological trends may require additional financial strategies, potentially involving partnerships with industry.

Conclusions, strengths and weaknesses

The study programme is supported by robust technical resources, and the addition of the drone laboratory will provide students with further hands-on research opportunities. However, continuous updates to equipment and stronger industry collaboration will be necessary to ensure the study programme remains competitive and up to date with the latest technological developments.

Strengths:

1. The Geodetic Instrument Calibration Laboratory and the upcoming drone laboratory will greatly enhance the practical learning and research opportunities for students.
2. The study programme is supported by a solid infrastructure, including high-performance workstations, GIS tools, and remote sensing software.
3. Students have access to an extensive range of digital resources and databases, including EBSCO, ScienceDirect, and Scopus.

Weaknesses:

1. Ensuring regular updates to equipment may become financially challenging in the future as technological advancements accelerate.

Evaluation of the requirement [R1]:

Requirement	Compliance			Justification
Compliance of the study provision, science provision (if applicable), information provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and for ensuring the achievement of learning outcomes.	Fully compliant	Partially compliant	Non-compliant	Advanced technical facilities and library resources, with upcoming improvements such as the drone laboratory.
	X			

Requirement [R2]: Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements of the laws and regulations.

Analysis:

The **Geoinformatics and Remote Sensing study programme** at **LBTU** is delivered by a qualified team of academic and visiting staff whose expertise aligns with both **national regulations** and the program's objectives. The mix of **professors**, **associate professors**, **lecturers**, and **visiting academic staff** brings a well-rounded balance of **academic rigor** and **industry relevance**. The qualifications and engagement of these staff members are pivotal to ensuring the program's effective implementation and the achievement of its learning outcomes.

1. **Compliance with National Qualification Requirements**: Latvian regulations mandate that higher education institutions have a minimum number of academic staff holding **doctoral degrees** involved in the delivery of study programmes. Specifically, for the Geoinformatics and Remote Sensing study programme, at least **five professors or associate professors** must be actively teaching and conducting research in fields relevant to geoinformatics, remote sensing, and related disciplines. The study programme meets this requirement, with professors specializing in **geospatial technologies**, **GIS**, **remote sensing**, and **environmental monitoring** (LBTU report for the academic master, Annex 3.).

   Many of the professors involved in the study programme hold **PhDs in geospatial sciences** and have substantial academic credentials. Their research expertise spans crucial areas such as **geospatial data analysis**, **urban planning**, **surveying technologies, geodesy**, and **drone-based remote sensing**. This ensures that the curriculum is delivered by professionals who are not only well-versed in theoretical concepts but are also active contributors to advancements in the field. Furthermore, their continuous engagement in **research projects** enables them to integrate **cutting-edge knowledge** into the courses they teach, keeping the study programme updated with the latest scientific discoveries and technological innovations (LBTU report for the academic master, page 17).

2. **Visiting Professors and Lecturers**: The involvement of **visiting profesors from Poland, Lithuania** and **lecturers** further enriches the study programme by adding expertise from **international institutions** and **industry leaders**. These visiting academics bring **specialized knowledge** and **practical insights** into emerging trends, such as **big data applications** in geoinformatics, **artificial intelligence for spatial data interpretation**, and **new developments in remote sensing technologies** (LBTU report for the academic master, page 16 and expert interviews with lecturers and employers). Visiting lecturers frequently conduct **workshops**, **guest lectures**, and **seminars**, which provide students with exposure to **real-world applications** and new **technological advancements**.

   Their inclusion broadens the educational scope by ensuring students gain an understanding of **global practices** in geoinformatics and **industry-specific applications**, contributing to a more comprehensive learning experience. These professionals bring **practical examples** and **case studies** from the field, thus enhancing the curriculum by linking theoretical concepts to practical, real-world challenges.

3. **Language Proficiency and International Competency**: As the study programme is also offered in **foreign languages** (English), it complies with the national regulation that all

academic staff must demonstrate at least **B2-level proficiency** in the language of instruction. This is crucial for delivering courses to a diverse, international cohort of students. The academic staff are fluent in the relevant languages, which enables seamless communication and high-quality instruction for students from different linguistic backgrounds (LBTU report for the academic master, page 17; expert interviews with lecturers, employers and students). The compliance with language requirements ensures that students can engage with the material effectively, regardless of whether it is delivered in **Latvian** or **English**, thus enhancing the program's appeal to **international students** and supporting LBTU's broader goal of internationalization.

4. **Research and Academic Contributions**: A significant number of the professors are actively engaged in **international research projects**, collaborating with **European research institutions** and **industry partners**. This ongoing involvement in research helps to align the study programme with the latest developments in **geospatial science**. Many faculty members regularly present their findings at **international conferences** and publish their work in **peer-reviewed journals**. Their active participation in the global academic community ensures that they bring the latest scientific discoveries and technological innovations into the classroom, providing students with a contemporary and future-oriented education (LBTU report for the academic master, page 12).

Additionally, the research backgrounds of the academic staff enable them to mentor students effectively, particularly during their **master's thesis projects**. Faculty members with extensive research experience guide students in developing **independent research projects**, ensuring that the study programme's graduates are well-prepared to contribute to the field of geoinformatics academically and science.

Conclusions, strengths and weaknesses

The qualifications and experience of the academic and visiting staff fully comply with the **legal requirements** and the **conditions for implementing** the Geoinformatics and Remote Sensing program. The program benefits from a diverse and highly qualified faculty who bring a blend of **academic expertise**, **practical experience**, and **research capabilities**. This ensures that students receive a comprehensive education that meets both **national educational standards** and **international industry demands**.

Strengths:

1. **Highly qualified academic staff**: Professors and associate professors have the required **doctoral qualifications** and are recognized for their contributions to **geoinformatics** and **remote sensing research.**

2. **International and industry exposure**: The program's inclusion of **visiting professors** and **guest lecturers** enhances the learning experience by providing access to **global expertise** and **cutting-edge industry practices.**

3. **Research-driven curriculum**: Faculty members are engaged in **international research projects**, ensuring that the latest advancements in **geospatial technologies** and **remote sensing** are incorporated into the curriculum.

Weaknesses: None identified.

Evaluation of the requirement [R2]:

Requirement	Compliance			Justification
Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements of the laws and regulations.	Fully compliant	Partially compliant	Non-compliant	The academic and visiting staff meet the national regulations for qualifications, language proficiency, and research involvement. The program benefits from the contributions of well-qualified professors and industry professionals, ensuring a high level of academic rigor and alignment with industry standards. Furthermore, their engagement in international research and language proficiency ensures the program's global relevance and accessibility to international students (LBTU report for the academic master; expert interviews with lecturers, employers and students).
	X			

Requirement [R3]: The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or artistic creation (if applicable).

Analysis:

The study programme for a master's degree in geoinformatics is fully based on the latest scientific achievements, integrating modern research methods, tools, and theories. Below are examples and details that demonstrate how the study programme adheres to this requirement after LBTU report for the academic master and expert interviews with lecturers, employers and students.

1. **Integration of Cutting-Edge Research**: The study programme's curriculum is designed around current research and innovations in geoinformatics and related disciplines. Students are exposed to advanced concepts in geographic information systems (GIS), remote sensing, and spatial data analysis. For instance:
    - Courses in **satellite data processing** leverage current developments in remote sensing, where students use the latest satellite imagery.
    - The study programme also incorporates **geospatial big data analysis**, which is a key area of research in modern geoinformatics. Students are taught to manage and analyze large datasets, reflecting trends in data-driven decision-making, which is critical in fields like urban planning, environmental monitoring, and disaster management.
2. **Practical Applications of Scientific Tools**: The inclusion of **advanced GIS tools** and **remote sensing technologies** is a strong reflection of how the study programme is grounded in practical, research-based applications. For example:
    - The study programme provides access to **state-of-the-art GIS software** such as ArcGIS and QGIS, which are widely used in the industry for spatial analysis and modeling.
    - The upcoming **drone laboratory** is a critical addition, reflecting recent technological advances in the use of unmanned aerial vehicles (UAVs) for remote sensing, environmental monitoring, and precision agriculture. This aligns the study programme with current trends in using drones to collect real-time spatial data, giving students the opportunity to work on cutting-edge projects and research.
3. **Interdisciplinary Approach**: The study programme also embraces an interdisciplinary approach, which is crucial in geoinformatics. For instance:
    - Courses combine **computer science**, **geography**, and **environmental science**. This reflects the broader scientific trend of interdisciplinary research, where skills in data science and environmental systems modeling are increasingly intertwined. For example, students may work on projects related to climate change modeling or urban growth forecasting, which combine geographic data with machine learning techniques.
    - Collaborations with other departments such as environmental engineering or IT are emphasized, allowing students to explore real-world problems and apply their knowledge in a multidisciplinary context. This mirrors industry trends where professionals must collaborate across sectors to develop comprehensive solutions to complex spatial problems.
4. **Research Engagement and Collaboration**: The study programme emphasizes student engagement in research projects that reflect the latest scientific findings and trends. This is reinforced through partnerships with research institutions and industry bodies:

- For example, the students can access the latest satellite data and engage in research projects that contribute to ongoing scientific inquiries in areas such as land use changes, environmental monitoring, and disaster risk management.
- Students are also encouraged to publish their research in peer-reviewed journals, often contributing new findings to the field of geoinformatics. This fosters a research-oriented mindset and ensures the study programme remains aligned with scientific advancements.
- The study programme's inclusion of **research-based internships** allows students to work directly with industry leaders and research institutions, applying the latest findings in real-world settings. For example, students might intern with geospatial data companies or environmental agencies, where they apply theoretical knowledge to solve current challenges in natural resource management or urban development.

5. **Technological Infrastructure**: The technical resources supporting the study programme are aligned with the latest innovations in geoinformatics. Examples include:
   - The **Geodetic Instrument Calibration Laboratory** ensures that students are familiar with high-precision surveying instruments used in geospatial data collection and analysis. This lab is equipped with tools reflecting the latest advancements in geodesy, allowing students to gain hands-on experience with industry-standard technologies.
   - The upcoming **drone laboratory** offers practical learning opportunities in UAV technology, which is becoming increasingly important for remote sensing and spatial data collection. This facility ensures students are trained in one of the most advanced methods of geoinformation collection, preparing them for roles in environmental monitoring, urban planning, and agriculture.
6. **Advanced Theoretical Knowledge**: The study programme integrates advanced theoretical knowledge in geoinformatics, including spatial statistics, geographic modeling, and data visualization techniques. Courses are designed to:
   - Explore recent developments in **spatial data analytics**, where students learn how to analyze large datasets to detect patterns and trends using machine learning and artificial intelligence. This reflects the current shift in geoinformatics toward big data and automation.
   - Teach **spatial-temporal modeling**, which is used for predicting environmental changes over time. Students are exposed to research on how to model climate change impacts, land-use transitions, and urban sprawl, all of which are critical areas of current scientific inquiry.
7. **Graduate Research Contributions**: Master's students are required to complete thesis that contribute to the advancement of knowledge in geoinformatics. Examples of recent graduate projects include:
   - A thesis analyzing **deforestation trends** using satellite imagery and GIS, contributing to global environmental monitoring efforts.
   - A project focusing on **urban heat islands** and how geospatial technologies can help mitigate their effects in densely populated cities, reflecting current research into climate adaptation.

Conclusions, strengths and weaknesses:

In summary, the master's study programme in geoinformatics and remote sensing is built on solid scientific foundations, drawing from the latest research and innovations in the field. With strong theoretical grounding, advanced technical resources, and significant industry and research collaborations, the programme prepares students to contribute to the evolving field of geoinformatics.

Strengths:

1. **Integration with Contemporary Research**: The study programme is aligned with the latest scientific trends and tools, such as the use of satellite data from ESA and cutting-edge GIS and remote sensing software, ensuring students work with the most current data and technologies.
2. **Practical and Research-Oriented**: Facilities like the Geodetic Instrument Calibration Laboratory and the drone laboratory provide students with hands-on experience, making the programme highly relevant for both research and industry applications.
3. **Collaborations with Leading Institutions**: Partnerships with the European Space Agency and other research bodies ensure the study programme remains at the forefront of scientific progress, offering students opportunities to participate in significant research projects.

Weaknesses:

1. **Financial Challenges for Technological Upgrades**: As technology advances rapidly, the need for regular upgrades to equipment and software could pose financial challenges. Ensuring that the programme keeps pace with technological advancements will require continuous investment.

Evaluation of the requirement [R3]:

Requirement	Compliance			Justification
The study programme for obtaining a master's or	Fully compliant	Partially compliant	Non-compliant	*The master's study programme is*

doctoral degree is based on the achievements and findings of the respective field of science or artistic creation (if applicable).	X			*research-oriented and integrates the latest scientific developments in geoinformatics and remote sensing. Students are required to complete a thesis that demonstrates their ability to conduct independent research, applying geospatial technologies and advanced data analysis techniques, prepares students for advanced roles in academia and industry (LBTU report for the academic master, page 10 and Annex 1).*

Requirement [R4]: Compliance of the study programme with the requirements of the Law on Higher Education Institutions and other laws and regulations.

To ensure that the **Geoinformatics and Remote Sensing** study programme at **LBTU** adheres to Latvian national regulations and aligns with the European higher education framework, it must comply with various laws and standards, primarily the **Law on Higher Education Institutions** in Latvia and related regulations. The compliance assessment in various areas is detailed in the table below.

No.	Requirement	Fully compliant	Partially compliant	Non-compliant	Justification

1.	The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard, including the minimum requirements for the content of the compulsory civil protection course and the content of civil protection training for employees specified for the implementation of the study programme. The study courses of the professional study programmes include a module for the development of professional competence of entrepreneurship in the amount of at least 6 CP, if it has not been acquired in the previous professional study programme or is not included in the theoretical basic courses of the study programme branch (field of professional activity).	X			*The Geoinformatics and Remote Sensing study programme adheres to the required academic standards for academic master's degree. The study programme includes the required number of credits (ECTS), appropriate duration, and coverage of core areas such as spatial data analysis, remote sensing, and GIS technologies, which are essential for achieving the learning outcomes. The program also includes such study courses as Labor and Civil Protection; Ecology and Environmental Protection. (LBTU report for the academic master, Annex 2).*
2.	The study programme complies with a valid professional (occupational) standard, or with the requirements of professional qualification (if it is not necessary to develop a professional standard for the profession), if a professional qualification is awarded after acquisition of the study programme				*Not applicable*
3.	The code of the study programme complies with the Cabinet regulations on the Latvian Education Classification	X			*The Geoinformatics and Remote Sensing study programme has a valid study code, and its structure, content, and scope are consistent with the Latvian higher education classification system (LBTU report for the academic master, page 8).*

4.	The qualification of the teaching staff[1] complies with the conditions and requirements set for the implementation of the study programme, which are specified in the regulatory enactments in the field of education including the participation in the implementation of an academic study programme of at least five professors and associate professors together who have been elected to academic positions in the respective higher education institution, except in the cases provided for in Section 55, Part two of the Law on Higher Education Institutions.	X			*The study programme has 19 professors and associate professors with doctoral degrees in geoinformatics, remote sensing, and related fields. These staff members meet the qualification criteria outlined in Latvian education law, ensuring high-quality teaching and research supervision (LBTU report for the academic master, Annex 3).*
5.	Confirmation of the higher education institution/college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language, according to the European Language Proficiency Assessment levels (the division of levels is available on the website www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language **or** proficiency of the Latvian language at least on the B2 level, if the study programme or a part thereof is intended to be implemented in the Latvian language and the lecturer has not acquired secondary or higher education in the Latvian language.	X			*The study programme is taught in a foreign language, all academic staff demonstrate B2 level proficiency in the language of instruction according to the European language proficiency assessment levels.* *From the interviews and documents, it can be concluded that the study programme with all 30 lecturers have at least B2-level knowledge of the English language. (LBTU report for the academic master, Annex 3, LBTU_apliecinajums_mag_ programmai_EN and expert interviews with lecturers).*
6.	The study programme, which is intended to be implemented in a	X			*The Geoinformatics and Remote Sensing study*

[1] *As used in this document, the term "teaching staff" refers to the academic staff and visiting professors, visiting associate professors, visiting lecturers, visiting lecturers, and visiting assistants of the corresponding higher education institution / college.*

	foreign language, complies with the requirements of Section 56, Part three of the Law on Higher Education Institutions				*programme fulfils the necessary legal requirements for delivering programs in foreign languages. The study programme includes materials that reflect both national and international trends, ensuring it meets Latvian educational objectives while being accessible to international students (LBTU report for the academic master, page 16).*
7.	The sample of the study agreement complies with the mandatory provisions to be included in the study agreement (if applicable).	X			*Annex, Example of Study Agreement of the Latvia University of Life Sciences and Technologies*
8.	The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure by which state recognised documents of higher education are issued (if applicable).	X			*The diploma issued for graduates of the Geoinformatics and Remote Sensing study programme complies with national regulations on higher education diplomas. The qualifications awarded are properly recognized both within Latvia and across European qualification frameworks, enabling graduates to pursue further education or professional roles internationally (LBTU report for the academic master, Annex Diploms_pielikums_mag_prog_EN).*
9.	The higher education institution/ college has confirmed that it will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a	X			*LBTU guarantees that, in the event of the study programme's discontinuation, students can transfer to another accredited study programme within the faculty. This is*

	contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued (if applicable).				*backed by a contract with students, ensuring students' academic progress is not disrupted (Annex, Example of Study Agreement of the Latvia University of Life Sciences and Technologies).*
10.	The higher education institution/ college has confirmed that it guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or omissions) and the student does not wish to continue the studies in another study programme (if applicable).	X			*LBTU ensures that students are protected through financial compensation policies in case of study programme de-accreditation or the revocation of the program's license. This commitment is in line with Latvian higher education law (LBTU report for the academic master, Annex, Example of Study Agreement of the Latvia University of Life Sciences and Technologies).*
11.	At least five teaching staff members with a doctoral degree are among the academic staff of an academic doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field of science. At least five teaching staff members with a doctoral degree are among the academic staff of a professional doctoral study programme in arts (if applicable).				Not applicable

12.	The scientific and pedagogical qualification of doctors of science complies with the criteria specified in the regulatory enactments regarding the evaluation of the scientific and pedagogical qualification of a candidate for the position of a professor and an associate professor (if applicable).				*Not applicable*
13.	The joint study programme complies with the requirements prescribed in Section 55^1, of the Law on the Higher Education Institutions (if applicable).				*Not applicable*

Conclusion:

The **Geoinformatics and Remote Sensing** study programme at LBTU is **fully compliant** with the requirements of the **Law on Higher Education Institutions** and other relevant Latvian regulations. The study programme aligns with the **State Academic Education Standard**, adheres to professional standards, and meets the criteria for academic staff qualifications, diploma issuance, and language proficiency. The institution provides guarantees for study programme continuity and student rights in the case of study programme's discontinuation or de-accreditation, ensuring full compliance with national regulations.

Evaluation of the requirement [R4]:

Requirement	**Compliance**			**Justification**
Compliance of the study programme with the requirements of the Law on Higher Education Institutions and other laws and regulations.	Fully compliant	Partially compliant	Non-compliant	*The study programme meets all necessary legal and regulatory standards, including compliance with the State Academic Education Standard, and requirements for teaching staff qualifications, language proficiency, and diploma issuance. The study programme also provides adequate protection for students in case of study programme's changes*
	X			

				(LBTU report for the academic master, page 17).

4. Implementation of the recommendations received during the licensing of the study programme

Assessment of the implementation of the recommendations provided by the licensing experts of the study programme.

Analysis

The university has taken commendable steps to implement the recommendations from the licensing process. Key recommendations from the experts included revising and expanding the reading lists to include international resources, improving industry collaboration, and ensuring the programme meets industry and academic standards (LBTU report for the academic master, page 8). A key area of progress is the revision of the curriculum, which has been adapted to ensure that it meets current industry and academic standards. For example, courses such as "Geospatial Information Systems" and "Remote Sensing Technologies" have been updated to include modern tools and methodologies, providing students with relevant skills (LBTU report for the academic master, page 16). Additionally, the university has made praiseworthy updates to the equipment available for student research, including the development of the drone laboratory and plans for further technical upgrades (LBTU report for the academic master, page 12). Despite these advancements, some areas are still in progress. For instance, the reading lists for some courses have been supplemented with foreign language materials, but there remains a need for broader access to the latest literature in specific fields like geoinformatics and remote sensing (LBTU report for the academic master, page 15). The expansion of reading lists, particularly for international students, requires further work, and ensuring the inclusion of the most up-to-date literature remains an ongoing task. Similarly, industry connections have been initiated with ongoing efforts to strengthen collaborations with both local and international partners. For example, while the university has partnered with the European Space Agency, more structured collaborations are needed to ensure consistent guest lectures, internships, and excursions (LBTU report for the academic master, page 9). However, more structured collaborations are needed to provide students with additional opportunities for practical learning and research.

Conclusions, strengths and weaknesses

The university has made significant strides in revising the curriculum and upgrading equipment. However, expanding reading lists for international students and building stronger industry partnerships remain important tasks that are still in progress.

Strengths:

1. The curriculum has been revised to align more closely with industry needs.
2. Updated technical equipment, including the development of a drone laboratory, with further upgrades planned.

Weaknesses:

1. The expansion of reading lists for international students and inclusion of the latest literature are still in progress.
2. Industry connections and formal partnerships need further development.

III. Assessment of the study programme

Excellent	**GOOD**	Average	Poor

IV. Recommendations

The experts recommend that the Academic Master study programme Geoinformatics and Remote Sensing be included in the study field of "Architecture and Construction". The study programme aligns with industry needs and university strategy, but there are areas for improvement that should be addressed in the short and long term.

Recommendations for the elimination of the deficiencies identified (on a short-term basis):

(1) Increase the frequency of invited lectures from industry professionals and arrange more field trips or excursions to companies to expose students to real-world applications of geoinformatics.
Implementation deadline: Within the next 12 months.

(2) Improve marketing efforts to highlight the innovative aspects of the master's study programme, such as cutting-edge research opportunities, advanced technologies, and the study programme's interdisciplinary focus. Target students from related fields like architecture and engineering.
Implementation deadline: Initiate marketing campaign within 6 months.

(3) Allocate resources to establish a coordinator responsible for overseeing the annual update of module descriptions, with a focus on ensuring the inclusion of the latest literature and international resources. This will ensure that teachers consistently review and refresh reading lists, especially for international students, to keep the study programme current.
Implementation deadline: Coordinator appointed and process implemented within the next academic year.

Recommendations for the improvement of the study programme (on a long-term basis):

(1) Establish formal channels for industry feedback on curriculum design and course content. This could involve setting up an industry advisory board dedicated to the master's study programme and regularly reviewing the study programme's content with input from key industry stakeholders.
Implementation deadline: Within the next 2-3 years.

(2) Broaden collaboration with international research institutions and industry partners to provide more opportunities for students, including research-based internships, joint projects, and exchange programmes. This will also help attract a more diverse student population.
Implementation deadline: Within the next 2-3 years.

(3) Establish a long-term financial plan to ensure continuous investment in upgrading technical equipment and maintaining high-quality resources.

Implementation deadline: Develop a long-term financial plan within the next 3 years.