APPLICATION

Study field "Information Technology, Computer Hardware, Electronics, Telecommunications, Computer Management, and Computer Science" for assessment

Study field	*Information Technology, Computer Hardware, Electronics, Telecommunications, Computer Management, and Computer Science*
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Self-evaluation report

Study field "Information Technology, Computer Hardware, Electronics, Telecommunications, Computer Management, and Computer Science"

Vidzeme University of Applied Sciences

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1. Information on the Higher Education Institution/College

1.1. Basic information on the higher education institution/ college and its strategic development fields,.

Vidzeme University of Applied Sciences (hereinafter - ViA) was established in 1996, and acquired a status of the State higher education institution in 2001. In 2002, ViA was accredited for an unspecified period. ViA offers high-quality study programmes and provides the balance between theory and practice. Study programmes are constantly updated and adapted to the current needs of society and changes in the labour market. The quality of education is ensured by experienced and professional teaching staff, advanced forms of study, and integrated research and academic work.

ViA offers college programmes, undergraduate, postgraduate and doctoral programmes, in total – 17 programmes. ViA study programmes are implemented in **five** study fields which are combined in two faculties – the Faculty of Engineering and the Faculty of Society and Sciences. Information on the list of study fields and programs is provided *in Annex 1* of the self-evaluation report.

During the reporting period (2013 - 2022, annual statistical data as of October 1), the average number of students enrolled in ViA per year is 267 students, the average total number of students per year is 789, with an average drop-out rate of up to 187 students who have not completed the study program or passed the theoretical course (the state final thesis has not been submitted and defended within the deadlines set by the ViA). In addition to the total drop-out rate, the fact must be taken into account that some students resume their studies after exmatriculation in the later stages of studies (average 20 students per year) or for the development and defense of a national final thesis (average 35 students per year). The average number of graduates per year in the reporting period - 171 graduates. During the reporting period, the number of students tends to decrease to an average of 5% per year, citing the demographic situation in Latvia as a whole, as well as taking into account the development of priority study and research areas defined in the ViA strategy, consolidating several study programs. In addition, the consequences caused by the Covid-19 pandemic must also be taken into account. The detailed number of students can be reviewed in the annex to the report *(see Annex 2).*

Research work at ViA is carried out at two scientific institutes – the Institute of Social, Economic and Humanities Research (hereinafter - HESPI), established in 2015, and the Institute of Socio-Technical Systems Engineering (hereinafter - SSII), which was established in July 2006.

The vision of ViA – “ViA is an internationally recognized regional platform for higher education, science, knowledge transfer and idea leadership, offering versatile opportunities of the digital age ecosystem for acquiring professional higher education and interdisciplinary research, responding proactively to societal challenges.” The mission of ViA is to promote sustainable development of the knowledge society at the regional and national level, providing private and public sectors with high-level professionals, as well as conducting research to solve problems of public interest.

The aim of ViA is to build the future society in Vidzeme, Latvia and Europe by participating in regional, national and international knowledge ecosystem networks, with education, research and innovation as the main areas of activity.

The previous ViA strategy 2016-2020 was developed and approved in 2015 during the leadership of Rector G.Krūmiņš. Work on the new strategy for 2021-2024 was started already in 2019. However, with the start of the reform of the higher education (hereinafter - HE) system, which focused on changing the governance model of HE, the development of the strategy was in line with the information available from education policy makers, delaying the strategy development process.The new ViA strategy is currently in the process of being developed, led by the five-member ViA Council. In the summer of 2022, the Cabinet of Ministers adopted regulations on strategic specialization of universities. According to this, the areas of strategic specialization of ViA are: 1) **engineering and technology (thematic area of education - computer science);** 2) social sciences (thematic areas of education - information and communication sciences, business and administration, personal services). The strategic specializations of the universities have been defined, allowing ViA to continue the work of completing the new strategy. Throughout this period (from 2020), ViA has been working both according to the previous strategy, which is still relevant despite the time of its development, and, given the active involvement in international partnerships and projects in recent years, also according to the strategic specializations.

Since 2020, ViA has been cooperating closely with Valmiera Municipality and Valmiera Development Agency, and participated in Valmiera's strategic development planning for 2030, taking into account ViA's study and research offer and development opportunities, with the main emphasis on circular economy, wooden building construction, sustainable development, IT areas. These areas are included in the Valmiera Industrial Territories Development Plan, and it is planned to create 1770 new jobs in the planned period. In the context of city, county and regional development, ViA has defined tasks: preparation of a highly qualified workforce, provision of lifelong learning and retraining of the workforce, provision of research and promotion of innovations - development of new companies.

Refer to the annex for a list of ViA study programmes (see Annex 1).

Refer to the annex for student number dynamics during the assessment period (see Annex 2).

ViA strategy *both in Latvian and English* is available on the ViA website.

1.2. Description of the management structure of the higher education institution/ college, the main institutions involved in the decision-making process, their composition (percentage depending on the position, for instance, the academic staff, administrative staff members, students), and the powers of these institutions.

ViA is a derived public person. ViA was founded by the State, and its legal operation is regulated by the ViA Constitution. ViA is managed in accordance with the democratic management style and the principle of collegiality. Faculty deans and heads of other

academic and administrative structures, as well as representatives of the student board are involved in the decision-making process, planning and implementation of ViA operational and strategic management. Operational management issues are addressed at weekly management meetings. ViA operational management is organized by the administrative vice-rector. The meetings are open, and information of the meetings is sent electronically to ViA staff. In order to assess the current processes and to successfully organize the study work, once a month ViA helds workshops of the study field and study programme directors, as well as meetings to deal with development, academic and scientific issues.

Taking into account the changes in the management of higher education institutions, ViA has not yet developed and approved the new management structure, the approval of which, according to the new procedure, is under the control of the Council of ViA. At the time of submitting the self-assessment report, the ViA the Rector of ViA has on his agenda the process of selection of Vice-Rectors, with the expectation that the governance structure will be approved after the establishment of the Rector's team. The annex to the report provides an overview of the current ViA governance structure.

Although there are planned changes in the structure of ViA, the main decision-making bodies of the management and representation of the ViA are:

Constitutional Assembly – the highest management institution of ViA, which approves the Constitution of ViA and its amendments, elects the Rector, as well as may initiate the removal of the Rector from his position; hears and approves the annual reports on ViA performance prepared by the Chairman of the ViA Council, the Rector, the Chairman of the Senate and the Audit Commission; elects the members of the Senate from among the academic and general staff and approves the regulations of the Senate, as well as may recall the members of the Senate; forms and elects the Audit Commission; elects the Academic Arbitration Court and approves its regulations, as well as reviews and decides on other strategic issues related to the activities of ViA and does not fall within the competence of other administrative institutions. The Constitutional Assembly is elected for three years. The Constitutional Assembly consists of 40 persons, of whom 24 representatives are elected from the academic staff, 8 representatives are elected from the general staff, and 8 representatives are elected from among the students.

ViA Council - a collegial highest decision-making body of ViA (consisting of 5 members of the Council), which is responsible for the sustainable development, strategic and financial supervision of ViA, as well as ensures the operation of ViA in accordance with the objectives set in its development strategy. The operation of the ViA Council is determined by the ViA Constitution, the regulatory enactments of the Republic of Latvia and the corresponding regulations of the ViA Council. The ViA Council protects the autonomy of ViA, as well as respects the academic freedom of academic staff and students and promotes its implementation.

Senate – collegial ViA's highest academic decision-making body, which is responsible for the excellence, development and compliance with internationally recognized quality standards of higher education, research and creative activities. The Senate regulates ViA's academic, creative and scientific activities. The Senate is elected for three years; its election and operation are determined in accordance with the Law on Higher Education Institutions, as well as the regulations of the Senate, which are approved by the Constitutional Assembly. The Senate consists of 15 senators: 11 representatives of the academic staff (73%), three representatives of the students (20%) and administrative staff (rector) - (7%).

Rector - the highest official of the higher education institution (HEI) who implements the general administrative management of the HEI and represents the HEI without special authorization. When establishing a structural unit for the performance of organizational, economic and service work, the Rector shall approve its regulations and determine the procedures for its establishment, financing and supervision, as well as the basic rules of operation. When taking decisions on the reorganization or liquidation of a structural unit, the Rector shall determine the procedure for the implementation of the said decisions. In accordance with the goals set in the ViA Development Strategy, the Rector appoints and removes Vice-Rectors, as well as determines their areas of competence, powers and responsibilities in accordance with the procedure for nomination, appointment and removal of ViA Vice-Rectors approved by the ViA Council and Senate. In accordance with the goals set in the ViA development strategy, the Faculty Council nominates and the Rector appoints and dismisses the Deans, as well as determines their areas of competence, powers and responsibilities. The Rector supervises the scientific activity of ViA.

Vice-rectors (in the academic, scientific and administrative fields) - ViA administrative staff whose basic functions are administrative work. Vice-rectors, without special authorization, represent ViA in cooperation with state and local government institutions and other cooperation partners within the scope of competence defined in their work duties. Vice-rectors work to ensure the implementation of ViA's goals, the fulfillment of the mission, development and efficient, legal and competitive operation. Vice-rectors are appointed by the rector for no longer than their term of office.

Academic Arbitration Court – is a permanent ViA institution that reviews applications of students and academic staff regarding restrictions or violations of academic freedom and rights specified in the Constitution of the ViA, disputes between ViA officials, as well as administrative units of structural units in subordinate relations, as well as in cases specified in the Law on Higher Education contesting an act or actual action and taking relevant decisions regarding them, as well as performing other tasks provided for in the Constitution of the ViA. The Arbitration Court consists of 3 (three) members, of whom 2 (two) are elected by secret ballot by the Constitutional Assembly for two years from among the academic staff elected to academic positions (67%), and 1 (one) is elected by the student self-government from among full-time students (33%).

Audit Commission - a representative institution of ViA, which performs internal audit tasks and operates in accordance with the laws and regulations of the Republic of Latvia, the Constitution of the ViA and other internal laws and regulations of the University. The purpose of the Audit Commission is to check the compliance of the activities of ViA with the regulatory enactments of the Republic of Latvia, the Constitution of ViA and other internal regulations of the university, as well as the decisions of the Constitutional Assembly, ViA Council and Senate. The Audit Commission consisting of 3 (three) persons is elected by the Constitutional Assembly for three years. The members of the Audit Commission may be removed by the Constitutional Assembly. Representatives of the elected academic staff and students may be elected to the Audit Commission.

Assemblies of the Faculties are collegiate decision-making institutions for academic, scientific and research activities of the faculties. The Assembly of the Faculty of Society and Sciences consists of 13 (thirteen) members: 10 (ten) representatives of the academic staff (77%), 3 (three) representatives of students (23%). The Assembly of the Faculty of Engineering consists of 8 (eight) members: 6 (six) representatives of the academic or research staff (75%), 2 (two) representatives of the students (25%).

Refer to the annex for ViA structure (see Annex 3).

Refer to the annex for the list of the main ViA internal normative documents and regulations (see Annex 4).

1.3. Description of the mechanism for the implementation of the quality policy and the procedures for the assurance of the quality of higher education. Description of the stakeholders involved in the development and improvement of the quality assurance system and their role in these processes.

ViA Study Quality Assurance Policy is part of ViA quality management system promoting ViA internal quality culture and its continuous improvement. It has been developed, reviewed and implemented in accordance with the *Standards and Guidelines for Quality Assurance in the European Higher Education Area (2015)*, *the Law on Higher Education Institutions* of the Republic of Latvia and other regulatory enactments, while taking into account the views and needs of ViA's internal and external stakeholders. The policy supports the development of a quality culture in which all internal stakeholders take responsibility for the quality and engage in the quality assurance at all levels.

The following is an overview of the different aspects of the quality assurance system.

Quality assurance policy and measures

ViA has developed and approved a development strategy for 2016-2020, which envisages striving for excellence and competitiveness in education, striving for excellence and competitiveness in science and research, as well as knowledge transfer and contribution to the development of the region. From 2022 onwards, the Council of VIA (in accordance with the Law on Higher Education Institutions) decides on the development and financial issues of the strategy. The Faculty of Engineering implements the strategic objectives in the Faculty's study fields. The strategic control over the development of ViA is exercised by the Senate of ViA, while the administrative and accounting control is exercised by the Faculty of Engineering (IF). The IF regularly (weekly) evaluates its activities and planned activities. The Faculty Council meets once a month to decide on important issues.

Important issues are decided at the monthly meetings of the assembly of the faculty. ViA has a **Scientific Council** which task is to promote coordinated and purposeful ViA academic and research activities in accordance with the ViA strategy. The ScientificCouncil advises and, if necessary, prepares proposals for the Senate and the Rector on strategical issues of the academic and scientific research activities important for the higher education institution, including launching new research directions in ViA. The qualifications and competencies of the academic staff are assessed on the basis of their professional, academic and scientific achievements. Every year, the development of the study field is assessed as the self-assessment report is prepared and discussed within the study field, at the faculty level, and also in the ViA Senate.

Since 2018, study programme advisory boards have also been involved in quality management. Every year after the final thesis defence, study programme directors discuss the quality of study programme results with the members of the State Examination Board, listening to the

recommendations, suggestions and criticisms of the Board members.

ViA has approved a number of documents that regulate the relationships between teaching and research, the institution's quality and requirement strategy, and the organization of the quality assurance system. There is a regulation in place laying down responsibilities of faculties, fields of study, other structural units and persons for quality assurance, as well as specifying the participation of students in quality assurance, and the ways of implementing, monitoring and adjusting the quality policy. All regulatory documents are available to both students and academic staff on the ViA e-environment. Students are informed both in the introductory lectures and later in the study process about their rights and opportunities to participate in the development and implementation of ViA development policy. ViA student self-government which delegates candidates to the ViA Senate and Constitutional Assembly elections, organizes a meeting with ViA Rector and/or heads of the study fields as needed.

ViA has developed the **Procedure for the Development, Approval and Supervision of the Study Programmes** and other documents, regulations related to ensuring the high-quality study process.

The study programmes and their components are developed to meet the goals, which, in their turn, correspond to the ViA strategy. Study programmes are developed using the vision of external stakeholders, they correspond to the defined learning outcomes which comply with the *Latvian and European Qualifications Framework*.

Quality assurance and assessment of the work of the academic staff

ViA has a number of measures in place to make sure and verify suitability of lecturers qualifications and competences for working with students, i.e., requirements are laid down in ViA **Regulations on Election to Academic Positions,** ViA **Regulations of Remuneration** contain breakdown of academic work, conditions for research work, likewise student surveys after each lecturer's study course in the respective semester are also taken into account. ViA Senate has approved **a job description of the teaching staff**; it lays down requirements for academic work, research, academic and scientific qualification improvement, as well as administrative work. In order to ensure improvement of skills, work quality and professional development of ViA academic staff, the lecturer is given an opportunity to supplement and expand his/her knowledge and professionalism by gaining foreign experience or engaging in internship at foreign higher education institutions/organizations, as well as by participating in relevant seminars and conferences – within Erasmus, etc. mobility programmes. Once per academic year (in October), the lecturer must submit a report to the dean of the faculty specifying his or her achievements in scientific work, experience gained in projects, seminars and conferences attended during the previous academic year. The information submitted is used for the preparation of scientific reports and self-assessment reports of the study fields. In order to provide an opportunity for lecturers to improve and monitor the quality of their academic work, ViA implements various activities, incl. study course assessment surveys and study course observations.

The academic staff of the study field consists of elected lecturers, as well as of industry professionals who give not only individual guest lectures, but also teach complete study courses. This is one of the ways to balance the acquisition of theoretical and practical knowledge in the study content. The decision on the approval of both the elected lecturers (lecturers, assistant professors) and guest lecturers, based on the decision of the study field, is made by the Assembly of Faculty after getting acquainted with each applicant's qualifications and competencies. For the purpose of improving professional skills, ViA's elected lecturers participate in Erasmus+ and other professional development mobilities, attend courses offered

by ViA, participate in the activities of professional organizations, etc.

Resources for academic work and research, support for students

ViA material and technical base and infrastructure enable students to acquire knowledge providing proper, suitable and available resources for each study programme. ViA library provides information resources necessary for academic and scientific activities, access to scientific articles and other electronic information databases from the ViA library portal. ViA also has e-learning environment which is an interactive student support environment containing study materials, it ensures electronic exchange of documents and communication with a lecturer, it also provides for an opportunity to submit test papers.

ViA has two buildings for the study process, science, research and administrative activities, with a total area of 7312 m^2 of which 2387 m^2 are used directly for the study and research process. The current study base consists of 38 classrooms (total area of 1445 m^2), including 3 computer classrooms with 90 workstations and Internet connection (195 m^2) and 12 laboratories: *Construction Laboratory; Spatial Research Laboratory; Energy Efficiency Laboratory; Data Security Laboratory* (*Cyber Security Laboratory); Computer Network Laboratory; Virtual Reality Laboratory; assets of the Multimedia Laboratory for study management and technology research field; assets of the Multimedia Laboratory for communication ecosystems and technology research field; Laboratory of Simulation Modelling and RFID Technologies; Mobile Technology Laboratory; Mechatronics Laboratory; Electrical Engineering Laboratory* (total area 324 m^2). All computers are connected in a common network providing a unified information circulation; access to the Internet and usage of databases are also ensured. Subscribed full-text databases are accessible by logging in from anywhere where the Internet is available. A conference hall (257 m^2) is also used for the study process; the study buildings have rooms for group work and rooms where students can work independently (350 m^2). Booking and reservation system intended for booking premises, lecture-rooms and hostel rooms provides for a possibility to follow the lecture schedule.

ViA provides career development support services to students and applicants, enabling them to make decisions on the future education or employment, to find the most appropriate study field, to choose the most appropriate ways for developing their competencies through personal and ViA's resources, to prepare for successful professional activities, to develop their personality by achieving professional goals, to plan further education, to start their own business, as well as provides support regarding other career issues. The main career development activities at ViA are career counselling for students individually or in small groups (including counselling on writing CV, job hunting, getting ready for job interviews, etc.), as well as counselling for applicants helping choose the most suitable study field for starting studies at ViA. The mentor movement is also being developed, involving ViA graduates. ViA closely cooperates with companies of the industry, regularly informing students on current job vacancies and internship offers, and helps students get ready for starting the job and internship. Career development support is also fully integrated into study courses, raising awareness of employment in the industry through collaboration with industry experts and specialists.

Information management

ViA key performance indicators are assessed and analyzed on an annual basis and reflected in self-assessment reports, annual management reports and other types of reports, while information on the student academic progress, achievements and drop-out rates, student satisfaction with the study programmes and graduate career is collected centrally, using both

qualitative and quantitative methods – analysis of statistical and financial indicators, document analysis, as well as surveys of applicants, students and graduates.

ViA ensures efficient collection of information necessary for the management of study programmes and other processes through ViA website and social networks, as well as through ViA study administration information system *LAIS* (which provides for a possibility to collect data on all aspects of studies and successfully use them in the study process, besides students can keep track of their study assessment progress in their profiles), Record Keeping System, E-learning environment *Moodle*, ViA alumni database, Library system *ALISE*, Accounting system *Horizon*, and Study and student loan accounting system.

Information to the public

ViA regularly publishes up-to-date, neutral and impartial information of its activities on the website, including information on the college, Bachelor's, Master's, and higher level study programmes, degrees/qualifications and selection criteria for admission; expected learning outcomes of the programmes, qualifications to be awarded, teaching, learning and result assessment procedures, the minimum satisfactory grades or requirements, learning opportunities available to students and extracurricular activities, as well as information on career possibilities after graduation and graduate employment.

Each year ViA prepares, approves and publishes self-assessment reports of the study fields, as well as admission rules for the current academic year. ViA lecturers and employees are actively involved in the development of public opinion in the region and Latvia by participating in conferences, seminars, public lectures, NGO activities, by publishing scientific publications; the most up-to-date information of the above is posted on the ViA social media accounts and website, thus promoting higher education and study programmes.

ViA regularly posts up-to-date, neutral and impartial information on its activities, programmes and degrees/qualifications on social media – *Facebook*, *Twitter*, *draugiem.lv, Instagram, YouTube*, as well as in printed leaflets and other handouts. Besides, up-to-date information that is relevant to current and future students, graduates, and other stakeholders and the public is posted on social media in Latvian and English. Information that is relevant to a specific person or groups of people, such as lecturers, ViA's administration staff, or students of a particular study programme, is emailed.

A contact with ViA graduates is maintained by help of the *Facebook* group "ViA Alumni", where ViA posts up-to-date information that is relevant to graduates, such as employment possibilities at ViA, gatherings, possible participation in events. At the time of submitting the report, the ViA Alumni Movement has been established, the Board has been elected and the process of establishing the VIA Alumni Association has started.

Media of the industry and other means of media at the regional and national level are also informed of ViA's activities and current events, inviting them to distribute information to the general public through print, electronic media or other versions and/or on their social media accounts. Besides, within the limits of competence, media representatives are provided with relevant information on current events, developments and news related to ViA, its staff, or students. Media monitoring is carried out on a daily basis, collecting information of ViA and current events related to it which is published in the media. Upon assessing the relevance and appropriateness of the information, it is re-posted on the institution's social media accounts.

Lecturers, students and graduates are interviewed in order to promote study fields, those interviews (print interviews and video interviews) are published on ViA website, as well as posted on social media *Facebook, Twitter, draugiem.lv, Instagram* and *YouTube*. Besides, to

promote study fields, ViA's website and social media accounts feature information on students' individual work, achievements in science, conferences, competitions, as well as on the study process and possibilities to improve their knowledge in ViA laboratories, during internship at companies, through courses, classes, creative workshops offered by ViA, etc. In order to ensure ViA publicity outside Latvia, information on ViA study programmes and possibilities for joint projects is presented to foreign cooperation partners within the framework of the mobility programmes.

Lecturers of the study field regularly participate in local and international conferences, seminars, public discussions as opinion leaders, act as experts in European Union projects on an international scale, regularly acquire new knowledge as participants in experience exchange missions, thus promoting the name of ViA and the field and helping establish new cooperation links.

Cooperation with students and graduates

Every year ViA conducts student opinion surveys on compliance of the study programmes implemented at the higher education institution with the students' expectations, on the quality of the study programmes, informative, material and technical provision, the quality of the academic staff, the quality of international cooperation, as well as on other issues. Results of surveys are analyzed and assessed, and decisions on various changes and improvements are made on the basis of these results. Responses are used for planning development and ViA performance improvement.

At the level of the study field, at the end of each semester, the study field director summarizes the results of the survey, reviews them, analyzes responses given by the students and summarizes suggestions for improvement which are discussed with the teaching staff. Within the framework of the discussions, the necessary improvements in the course content, teaching methods, mutual cooperation between lecturers within the semester and the year are also reviewed.

ViA has active student self-government – Vidzeme University of Applied Sciences Student Association. There is also a broader cooperation with the student ECO Council, which involves students in practical projects integrated into the early courses of the training programme, such as competitions and development of ideas for landscaping the campus.

ViA also conducts a graduate survey on an annual basis. The main purpose is to document satisfaction of the graduates with their education immediately after graduation, as well as to collect data on graduate employment. A survey is conducted a year after graduation. The results of surveys show successful integration of the graduates of the Bachelor's and Master's programmes into the labour market, they work in the private, public and municipal sector of the industry in accordance with the qualification acquired.

Refer to the annex for the Study Quality Assurance Policy of Vidzeme University of Applied Sciences (see Annex 5).

ViA Study Quality Assurance Policy is also available on ViA website: https://va.lv/en/about-us/documents

1.4. Fill in the table on the compliance of the internal quality assurance system of the higher education institution/ college with the provisions of Section 5, Paragraph 2(1) of the Law on Higher Education Institutions by providing a justification for the given

statement. In addition, it is also possible to refer to the respective chapter of the Self-Assessment Report, where the provided information serves as justification.

1.	The higher education institution/ college has established a policy and procedures for assuring the quality of higher education.	see Point 1.3. of Part I
2.	A mechanism for the creation and internal approval of the study programmes of the higher education institution/ college, as well as the supervision of their performance and periodic inspection thereof, has been developed.	see Point 1.3. of Part I
3.	The criteria, conditions, and procedures for the evaluation of students' results, which enable reassurance of the achievement of the intended learning outcomes, have been developed and made public.	see Point 2.1.5. of Part II
4.	Internal procedures and mechanisms for assuring the qualifications of the academic staff and the work quality have been developed.	see Point 1.3. of Part I
5.	The higher education institution/ college ensures the collection and analysis of the information on the study achievements of the students, employment of the graduates, satisfaction of the students with the study programme, efficiency of the work of the academic staff, the study funds available, and the disbursements thereof, as well as the key performance indicators of the higher education institution/ college.	see Point 1.3. of Part I
6.	The higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study field whilst implementing their quality assurance systems.	see Point 1.3. of Part I

2.1. Management of the Study Field

2.1.1. Aims of the study field and their compliance with the scope of activities of the higher education institution/ college, the strategic development fields, as well as the development needs of the society and the national economy. The assessment of the interrelation of the study field and the study programmes included in it.

The mission of Vidzeme University of Applied Sciences (ViA) according to the ViA strategy is to promote the sustainable development of knowledge society at the regional and national level, providing the private and public sector with high-level professionals, as well as conducting research to address current societal challenges.

The strategy of the study field follows the general vision of the ICT industry regarding the development of information society in Latvia, the vision included in the Latvian National Development Plan 2021-2027 regarding the promotion of knowledge society, and statements expressed in the Latvian Digital Transformation Guidelines regarding the training of ICT specialists and digital transformation.

The main strategic goal of the study field is to prepare qualified specialists in the areas represented by the study field who could work for companies, organizations, governmental and municipal institutions, who are able to perform tasks related to their profession and are ready to continuously improve their knowledge and skills in a changing environment.

Objectives resulting from the main goal:

- To provide students with practically oriented higher professional education in the areas represented by the study field;
- To ensure the study process that meets requirements of the regulatory enactments and the labour market, as well as to ensure a student-centred approach in higher education;
- To develop scientific research skills in students, to motivate them to acquire further education, and to promote their further self-education;
- To provide versatile development of personal skills;
- To develop an adjustable training offer for companies and their employees in the specializations of the study field.

The studies are oriented towards professional higher education and close cooperation with industry professionals. This approach has given good results in terms of ViA graduate employment – most graduates of the Bachelor’s programmes and all graduates of the Master’s programmes are already employed in the industry during their studies.

There are five study programmes implemented in the study field – two Bachelor’s programmes (Information Technologies and Mechatronics), two Master’s programmes (Virtual Reality and Smart Technologies, Cybersecurity Engineering) and one doctoral programme – Sociotechnical Systems Engineering.

The Bachelor’s programme “Information Technologies” offers specialization in Virtual Reality and Smart Technologies and Cybersecurity Engineering, thus ensuring continuity in the Master’s programme. The study programme “Mechatronics”, in its turn, integrates courses of the IT study

field, providing insight into the fundamentals of ICT.

The programmes implemented in the study field correspond to the area “Information and

Communication Technologies" defined in the Smart Specialization Strategy of Latvia. Likewise, the set of programmes corresponds to the core areas of smart specialization in the economy of Vidzeme region – "Information technologies, especially information services – computer programming", as well as to the sustainable development strategy of Valmiera region 2022-2038, which states that cooperation with Vidzeme University of Applied Sciences and IT companies will provide an opportunity for Valmiera to become the centre of IT competence.

The professional Bachelor's programme "Information Technologies" implemented within the study field is relevant and necessary due to the acute shortage of specialists in the IT sector and their demand on the labour market. In accordance with the data provided by the Latvian Information and Communications Technologies Association (LIKTA), there are currently more than 7,050 ICT companies in Latvia, employing 38,400 employees. However, this number of employees is insufficient to ensure the growing demand for ICT specialists.

The report of the Ministry of Economics prepared in 2020 on the Labour Market Forecasts of Latvia until 2040 indicates a significant lack of highly qualified specialists in the ICT sector, which is related to both the automation of processes and the application of various technologies and innovations in the sciences. In accordance with the forecasts of the Ministry of Economics, the shortage of IT specialists in the labour market may reach up to 20,000 by 2025.

At the time of preparing the report, there are 815 vacancies in the area of Information Technology on the CV online job advertisement portal, ranking it as the most demanded area with the largest number of unfilled vacancies.

The survey conducted by the Digital Economy and Society Index in 2021 indicates that 48% of Latvian companies have faced difficulties in filling IT vacancies.

Along with the already existing difficulties in attracting employees in the IT sector, the Covid-19 pandemic and the subsequent Russian invasion of Ukraine had a serious effect on the world as a whole, drawing attention to cybersecurity risks and resulting in the need for highly qualified specialists who could provide protection against cyber attacks both at a local and national level. Currently, public and municipal institutions, as well as companies and individuals suffer quite regularly from cyber attacks of various scales – during the three quarters of 2022, 8 million EUR were defrauded from customer accounts with Latvia's four largest banks by manually approved payments, more than 700 persons were defrauded by fake supplier websites, and 326,676 unique IP addresses experienced threats of various severity.

Taking into account the rapid increase in the number of cyber attacks, the demand for cybersecurity specialists has increased by 350% in the last 9 years – from 1 million vacancies in 2013 to 3.5 million unfilled vacancies in 2021 (Cybersecurity Ventures).

Representatives of the leading ICT industry companies of Latvia also point to a critical shortage of mid- and high-level cybersecurity specialists in the industry.

Thus, the study programmes in Information Technologies and Cybersecurity Engineering offered by ViA prepare industry specialists who are currently in demand both nationally and globally.

As part of the study field, the second-level higher professional study programme "Mechatronics" is implemented. The demand for mechatronics technicians and engineers in Vidzeme is considered to be very high, as confirmed by job advertisements of employers and cooperation partners, employment of students and graduates in the industry. The demand for mechatronic technicians is

relevant not only for large companies such as A/S Valmiera Stikla Šķiedra and SIA Valpro, but also for small and medium-sized companies in various sectors of the national economy – both in food processing, woodworking, metalworking, etc.

In order to maintain market competitiveness at a local and international level, companies are forced to think about the efficiency of processes and the efficient use of resources (including energy). To solve these challenges, the task of mechatronic engineers is to develop production automation systems and solutions for process digitization that allow increasing production productivity and efficiency.

Doctoral studies implemented within the study field ensure the achievement of strategic goals at the highest level. Doctoral studies are implemented within the programme “Sociotechnical Systems Modelling” and provide research and development of IT solutions in various sectors of the national economy.

Research is conducted at the Socio-technical Systems Engineering Institute, which is headed by the Director of the institute. The institute is a structural unit of the Faculty of Engineering.

2.1.2. SWOT analysis of the study field with regard to the set aims by providing explanations on how the higher education institution/ college expects to eliminate/ improve weaknesses, prevent threats, and avail themselves of the given opportunities, etc. The assessment of the plan for the development of the study field for the next six years and the procedure of the elaboration thereof. In case there is no development plan elaborated or the aims/ objectives are set for a shorter period of time, information on the elaboration of the plan for the development of the study field for the next assessment period shall be provided.

Table no.1. *SWOT analysis of the study field*

STRENGHTHS	WEAKNESSES
• High demand for graduates in the labour market • Study programmes are focused on the labour market • Involvement of industry professionals in the study process • Age structure of lecturers • Involvement of lecturers in international further education and qualification improvement programmes • Small groups of students provide an individual approach to the study process and the opportunity to pay more attention to students and their growth • High proportion of students working in the industry • Modern study methods, e-learning and technologies, use of e-environment in the study process • Close cooperation with the industry ensures internship places and inclusion of industry novelties in the study process • Field trips to industry companies • Close cooperation with students of other programmes in engineering sciences (mechatronics, VR, IT, cybersecurity, construction) provides for an opportunity to ensure comprehensive competences • Participation in the E3UDRES2 network and activities • Involvement of international lecturers in the study process • Involvement of graduates in the implementation of study programmes and in the work of ViA’s advisory councils • Inclusive environment (adapted for people with physical disabilities – not only)	• Weak recognition on a national scale • Relatively low involvement of students and lecturers in mobility programmes • Low proportion of elected academic staff • Low remuneration for academic staff makes it difficult to attract high-level professionals and make them stay, as well as it can cause a risk of “burnout” of lecturers; • High workload of industry professionals in their basic work • Small number of fee-paying students • Limited financial opportunities for the involvement of international lecturers and local highly qualified specialists in the study process • Outdated IT infrastructure • A narrow range of services

OPPORTUNITIES	THREATS
• High development potential of study field programmes • Implementation of Master's programmes in English opens up opportunities for developing the study export offer • Participation in the E3UDRES2 consortium allows attracting international teaching staff, involving students in innovative learning projects, improving professional and pedagogical competences of the teaching staff • The remote study format allows attracting students from distant regions of the country • Micro-degree offered by the Master's programmes allows involving employees working for companies and reduces the study load for students • A close connection with the local government of Valmiera municipality and Valmiera Development Agency ensures awareness of new companies entering the region, investment attraction and development of the region; • As a result of the mobility of universities of the E3UDRES2 consortium, the labour force is attracted to the region; • Grant programmes allow students to get involved in the creation and commercialization of innovations; • Lecturers involved in research and innovation projects promote students' involvement in science and commercialization; • An offer of lifelong learning and individual courses for public and private companies.	• Worsening of the geopolitical and national economic situation • Industry professional certifications compete with the need for a higher education diploma • Negative demographic situation in the region (the number of young people of student age is decreasing) • The industry's high demand for labour force poses a threat to the interruption of studies • Negative influence of the national political decisions and lack of long-term education policy • Inconsistency in the implementation of short-term policy decisions results in developing stereotypes in society regarding the low quality of the Latvian higher education, as well as causes uncertainty in the space of higher education in Latvia and problems in attracting international students • The outflow of lecturers to industry due to insufficient funding • A small number of industry companies in Vidzeme region

The strengths include the conditions for further development of the study field, which, together with the skilful and purposeful use of opportunities, enable the implementation of competitive professional study programmes at both the national and international level.

Weaknesses include challenges that can be overcome by cooperation between the study fields and the administration within ViA, using the cooperation network of higher education institutions at the national and international level, as well as by more effectively cooperating with partner organizations and involving company employees and members of organizations in the educational process.

Targeted informational campaigns, as well as the promotion of the study field related content are planned to promote recognition on a national scale; it is expected that greater visibility and positive reputation of the programme will ensure greater interest in the programmes of the study field and an increase in the number of students. Taking into account the employment of students and the workload of lecturers, short-term ERASMUS+ mobilities are offered. In order to increase the proportion of elected academic staff, it is offered to involve doctoral students more actively in the study process and to elect them to academic positions. To balance remuneration, lecturers are encouraged to participate in research projects.

The involvement of industry professionals in the programme is one of the success factors of the programme, so it is planned to maintain contact with them and attract additional experts as guest lecturers in the study process. The attraction of international lecturers is ensured within the framework of mobility and international cooperation projects.

In cooperation with the ViA IT group, a long-term plan for the maintenance and development of the infrastructure necessary for the study field has been developed.

The threats caused by the demographic situation are planned to be eliminated by attracting international students, as well as by expanding the offer of the micro-degree programmes, while alternative sources of funding are being sought to ensure the necessary funding.

Refer to the annex for The Development strategy of IT study filed (see Annex 6).

2.1.3. The structure of the management of the study field and the relevant study programmes, and the analysis and assessment of the efficiency thereof, including the assessment of the role of the head of the study field and the heads of the study programmes, their responsibilities, and the cooperation with other heads of the study programmes, as well as the assessment of the support by the administrative and technical staff of the higher education institution/ college provided within the study field.

The study field operates within the Faculty of Engineering and is under the administrative supervision of the Dean. Each programme of the study field – Bachelor's programme ""Information Technologies", Bachelor's programme "Mechatronics", Master's programme "Cybersecurity Engineering", Master's programme "Virtual Reality and Smart Technologies", and Doctoral programme – is administered by the Director of the study programme, who is responsible for the implementation of the programme. Directors of the study programmes are supported by study specialists. The management structure of the study field can be seen in Figure 1.

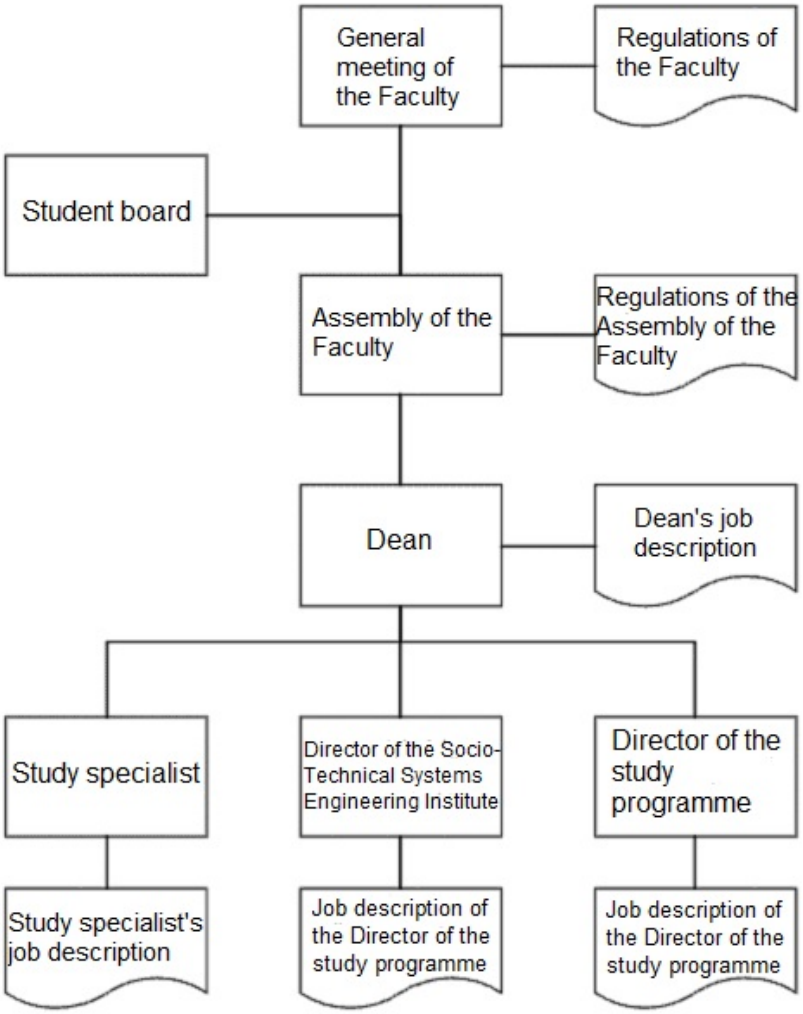

Figure 1. Management structure of the study field

Proposals and questions related to the study process are first discussed at the meetings of the study field, with the participation of the Directors of the study programmes, the Dean and the academic staff of the programmes; decisions are taken at the meetings of the Assembly of the Faculty of Engineering. The information about the decisions taken is given to the members of the general meeting of the faculty, which is represented by the teaching staff, guest lecturers, administrative staff and management of the faculty. The general meeting discusses the strategic development and future plans of the faculty, thus informing all participants involved in the study and management process about the current affairs of the faculty *(see the Regulations of the Faculty).*

The Assembly of the Faculty takes decisions on changes to the study programmes, elects lecturers, approves guest lecturers, the composition of the State examination commissions. The Assembly of the Faculty consists of eight members – six of them represent academic or research staff and two of them represent students *(see the Regulations of the Assembly of the Faculty).*

To ensure the quality, the following measures are implemented in the study field:

- The quality of study courses is assessed every semester during discussions between students and the Director of the study programme; afterwards feedback is given to the Dean of the faculty and, if necessary, also to the teaching staff of the relevant courses about thee things discussed.
- The Advisory Council of the study programme consisting of at least 7 representatives was established based on the Rector's order No. 149-2 of 12.03.2018. The composition of the Advisory Council is renewed when its composition changes.
- Strategic control – implemented by the Director of the study programme in cooperation with the Dean of the Faculty of Engineering and the Assembly;
- Administrative and accounting control is implemented by the Study Administration Group;
- The Assembly of the Faculty of Engineering discusses and analyses the self-assessment report of the study programme, admission results, academic progress, and the results of the State examinations;
- Results of the internship defence are discussed with the members of the defence commission and the Director of the study programme;
- Discussing/assessing the results of defence of the State examinations with the members of the defence commission and academic staff of study programmes, the Assembly of the Faculty of Engineering;
- Academic progress, self-assessment reports, the quality of internship and Qualification papers are discussed at the general meeting of the Faculty of Engineering at the end of the academic year, as well as during the half-yearly evaluation at the meetings of the Assembly of the Faculty of Engineering.

Study process support functions are provided by:

- Administrative Department which is in charge of areas such as study administration, international cooperation administration, IT infrastructure coordination, ViA operational management and maintenance of the material and technical base, financial management and accounting, marketing and public relations, as well as document management and circulation.
- Library
- Rectorate
- Knowledge and Technology Centre (KTC), promoting the transfer of knowledge and technology, attracting project funding, promoting cooperation with entrepreneurs, as well as

operating in the field of lifelong learning.

Several structural units of ViA provide support for the implementation of the study programmes of the study field. The following is a detailed description of each structural unit and its tasks in the implementation of the study programmes.

Socio-Technical Systems Engineering Institute (SSII)

Institutes are research structural units that ensure a scientific function. These structural units can provide employment for the academic staff in the area of research in order to develop and improve their relevant competencies and the quality of studies.

ViA Socio-Technical Systems Engineering Institute was founded in July 2006, it is under the wing of the Faculty of Engineering and unites researchers from all directions represented by the faculty programmes:

- Virtual reality technologies, visualization and computer vision
- Sociotechnical systems modelling technologies
- E-learning management and technologies
- Wooden Houses and Eco-building
- Cybersecurity solutions
- Mechatronics

Institute of Social, Economic and Humanities Research (HESPI)

The Institute of Social, Economic and Humanities Research is a structural unit of ViA established by the decision of ViA Senate of 25 September 2013. HESPI is registered with the Register of Scientific Institutes of the Republic of Latvia on 28 November 2013.

The main research directions of the institute are as follows: sustainable development of the national economy, sustainable tourism, micro-niches in tourism, development of protected nature and cultural territories, cultural space and development of cultural identity sites, Latvian social security system, social investment, innovation management, science communication, online communication and online media, regional development (interaction between rural and urban environments).

ViA study process support functions are ensured by the **Administrative Department**. The main functions and tasks of the department are as follows: study administration, international cooperation administration, IT infrastructure coordination, ViA operational management, financial management and accounting, marketing and public relations, as well as document management and circulation, and internal communication.

A detailed description of each function is given below.

Study administration: to plan, organize and administer study processes: student admission, planning of the academic year, planning of study places funded by the State budget, student registration, rotation, scholarships, reports to external cooperation partners; to ensure maintenance and development of the study information system; to manage and organize study record keeping and to ensure study record circulation, registration and archiving; to maintain a database of graduates, and to conduct graduate surveys.

International cooperation administration: to organize ViA international activities in cooperation with vice-rectors for academic and scientific affairs, and faculties; to ensure international mobility of ViA students, international students and staff; to establish and maintain ViA international cooperation partner network.

IT infrastructure coordination – systems, servers, computer networks, computers; to install and configure new hardware, including servers; to repair and maintain computer hardware; to equip ViA lecture-rooms with the equipment necessary for the study process; to ensure independent and qualitative operation of ViA computer network and to establish new connections to the existing computer network; to promote professional development of ViA staff in IT issues; to ensure protection of ViA information systems against third party intrusion.

ViA operational management and maintenance of the material and technical base: to maintain and repair electric power system, heating system, water and sewerage systems, ventilation and air conditioning systems, fire safety, alarm and notification systems; to ensure purchase and production of household items, equipment and furniture for ViA needs; to ensure record keeping, assembling and maintenance of inventory and furniture; to ensure cleaning and improvement of ViA buildings, premises and plots of land, including preparation of study premises for lectures; to ensure the operation of the hostel; to ensure compliance with the rules of procedure, labour protection requirements, and ViA internal regulatory enactments in ViA buildings.

Financial management and accounting: to develop a draft budget and submit it to ViA Senate for approving; to control rational use of ViA financial resources; to analyze ViA financial indicators; to keep record of the use of ViA funds in accordance with the approved estimates, as well as to keep record of liabilities and claims according to the laws and other regulatory enactments of the Republic of Latvia; to control the acquisition, use and management of material resources; to ensure organization and documentation of procurement procedures.

Marketing and public relations: to implement internal and external communication; to develop and implement the brand, marketing and PR strategy and operational plan of ViA; to coordinate ViA marketing activities by cooperating with various ViA structural units, other public and municipal entities and private entrepreneurs; to organize and participate in ViA marketing events in Latvia and abroad.

Organizing ViA document management and circulation and ensuring internal communication: to organize and manage document circulation at ViA, ensuring record keeping, document registration, preparation of orders, powers of attorney, statements, drafts of outgoing documents; to provide support to ViA management and staff in record keeping matters; to archive documents.

Library

Main functions and tasks of the library – to plan the development of the library collection; to provide the academic and scientific research process of ViA with media from the library collection and from libraries in Latvia and abroad through the interlibrary subscription; to store and systemise information on ViA history. In cooperation with the Directors of the study fields and teaching staff, to coordinate provision of the academic process with library resources; to develop the library's collection in accordance with ViA academic and scientific work directions, the requirements of the study fields, by co-operating and coordinating resources in collaboration with Valmiera Library; to collect, systematize, catalogue, bibliographically process and preserve printed publications, electronic publications, manuscripts and other documents; to make the library's collection available for independent studies and research, including availability of electronic databases; to maintain and develop a database of ViA academic staff and student papers; to advise ViA academic staff and students on the use of informative resources.

Rectorate – rector, vice-rector for academic affairs and research, vice-rector for administrative affairs, assistant rector-scientific secretary, lawyer-HR specialist.

Main functions and tasks of the rectorate: strategic management of ViA; ViA personnel management; legal aid; scientific management; project development, management and

supervision.

Knowledge and Technology Centre (KTC)

Main functions and tasks of the KTC: to promote knowledge transfer, applied research and the development of ViA infrastructure through the funding of projects at regional, national and international level; to cooperate with the education service providers in Vidzeme region to ensure the accessibility to and offer of education to all target groups by bringing together the legal and natural persons involved in the adult education, promoting their activities and cooperation for achieving the goal of the KTC; to develop and maintain cooperation with other educational and scientific institutions of Vidzeme region by offering their services in the field of knowledge and technology transfer; to establish and maintain contacts with partners in the private, public and non-governmental sector and to promote feedback with ViA; to operate within the networks of the lifelong learning partners: higher education institutions, scientific institutions, entrepreneurs, associations, adult education centres and Alumni. Within the framework of the KTC, it is planned to establish a contact point for the circular economy, wood and sustainable construction through which cooperation with representatives of the public and private sectors will be enhanced and training opportunities will be expanded in the future by individual courses for developing skills and improving knowledge for the people of the industry.

Refer to the annex for the Regulations of the Faculty (see Annex 7).

Refer to the annex for of the Assembly of the Faculty (see Annex 8).

2.1.4. Description and assessment of the requirements and the system for the admission of students by specifying, inter alia, the regulatory framework of the admission procedures and requirements. The assessment of options for the students to have their study period, professional experience, and the previously acquired formal and non-formal education recognised within the study field by providing specific examples of the application of these procedures.

Admission criteria to ViA study programmes are approved by ViA Senate which, in accordance with the Law on Higher Education Institutions of the Republic of Latvia, approves admission requirements to ViA undergraduate and postgraduate programmes by November 30. Upon applying for admission to the undergraduate programmes, the applicant or his/her authorized representative should complete an application and present a passport or ID card, a certificate of secondary education, certificates of centralized examinations specified in the admission regulations, documents permitting admission beyond competition if a specific criterion is laid down in the regulations *(see Annex 9).*

Upon applying for postgraduate programmes, the applicant or his/her authorized representative should fill in an application and present a passport or ID card, a document of higher education, as well as documents specified in the programme requirements *(see Annex 9).*

Upon applying for a doctoral programme, the applicant has to fill in an application and submit a copy of a document certifying applicant's previous education, a list of scientific publications and copies of publications, an application form of a potential doctoral thesis at the level of problem formulation *(see Annex 10).*

International applicants should additionally present a certificate of English proficiency in

internationally recognized examinations TOEFL (minimum 500 points for the test taken on-the-spot and 70 points for the online test), IELTS (minimum 6.0 points) or other evidence of English language proficiency. If previous education is acquired in English, evidence of English language proficiency is not required. In addition, a statement from the Latvian Academic Information Centre on the compliance of the education obtained abroad with the requirements of the admission regulations should be submitted.

It is possible to apply for the undergraduate studies at ViA electronically in the Information System of Unified Admission to Undergraduate Programmes (*VUPP IS*) through the e-service on the portal *www.latvija.lv*. It is possible to apply for the postgraduate study programmes, using ViA's electronic questionnaire *va.dreamapply.com*.

In accordance with the Cabinet Regulation No. 932, it is possible to start studies at ViA at a later study stages, subject to the requirements of the regulation regarding the mandatory amount of credit points, which is equalized to the content of ViA study programmes. Recognition of learning outcomes obtained in previous education is a regular procedure for any student who has started studies at the later stages and who, in accordance with international cooperation agreements, studied one to two semesters at a higher education institution abroad. In this case, the equalization of learning outcomes is performed by the Director of the study programme when the student has submitted supporting documents (an academic statement or diploma with a diploma supplement for previously obtained higher education). The equalization of learning outcomes with learning outcomes obtained within the framework of the international exchange programme is performed on the basis of the higher education institution cooperation agreement, the tripartite study agreement (Erasmus learning agreement) and the certificate of the study courses acquired.

In accordance with the Cabinet Regulation No. 505, every person has the right to submit an application to ViA for recognition of knowledge, skills and competences acquired in previous education or professional experience in the study programme implemented by the higher education institution or part thereof. Information on the possibilities of recognizing non-formal education or professional experience is available on the ViA website. Learning outcomes achieved by the person while studying (a student has been matriculated) in the study programme are recognized in accordance with the Cabinet Regulation No. 932 "Procedure for Starting Studies in Later Studies" of 16 November 2004.

A decision on the recognition of knowledge, skills and competencies acquired outside formal education or acquired through professional experience, as well as a decision on the recognition of learning outcomes achieved in previous education is made by the Learning Outcome Recognition Commission established by ViA. In accordance with the Regulations on the recognition of competences acquired outside formal education or through professional experience and on the recognition of learning outcomes achieved in previous education *(see Annex 11),* a person must submit an application for recognition of knowledge, skills and competences. The procedure for the recognition of learning outcomes is described in the above-mentioned regulations.

Information of ViA study fields and study programmes is published on ViA website *www.va.lv*. The Administrative Department of ViA (Marketing Group and Study Administration Group) is responsible for publishing the information.

Lifelong learning opportunities through the Open University

The service **Open University** of ViA Knowledge and Technology Centre (KTC) (https://ztc.va.lv/en/open_university) offers everyone an opportunity to apply for one of the study courses at Vidzeme University of Applied Sciences. It is an opportunity, on the basis of previously acquired education, to acquire the knowledge and skills offered by ViA study programmes. For

those ViA students who can not continue their studies due to academic or financial debts, this is an opportunity to maintain a connection with the higher education institution and continue their studies according to their abilities.

The Open University is an opportunity not only to fully master the content of the course, take examinations and receive an assessment in the chosen course like any ViA student, but also to get involved and understand the life of students and the environment of the higher education institution, and to receive a certificate issued by ViA after successful completion of the course.

The certificate issued by the KTC includes an indication that credit points corresponding to the study course have been obtained. In accordance with the Cabinet Regulation "Regarding Recognition of the Learning Outcomes Achieved in Previous Education or through Professional Experience", a holder of such a certificate may apply to any higher education institution or college of Latvia requesting to recognize the knowledge, skills and competence acquired while studying the particular course.

Course participants have free access to ViA library materials, databases, computer classes and other resources that facilitate and make the learning process easier.

Refer to the annex for ViA Admission Rules (see Annexs 9 and 10).

Refer to the annex for ViA Regulations on the recognition of competences acquired outside formal education or through professional experience and on the recognition of learning outcomes achieved in previous education (see Annex 11).

2.1.5. Assessment of the methods and procedures for the evaluation of students' achievements, as well as the principles of their selection and the analysis of the compliance of the evaluation methods and procedures with the aims of the study programmes and the needs of the students.

ViA Senate has approved the Study Regulations which lay down the procedure for the implementation of study programmes, rights and obligations of students, the procedure for financing studies and the general procedure for organizing State examinations. The Study Regulations lay down criteria, forms and terms for the assessment of students' knowledge, conditions regarding academic debts, and other requirements for achieving learning outcomes. Descriptions of the study courses and other programme components define requirements for the commencement of studies, goals and planned learning outcomes, outline the content necessary for achieving learning outcomes, a study calendar, compulsory and additional literature, and other sources of information, describe the organization and tasks of students' independent work, define criteria for assessing learning outcomes.

Academic progress of students is assessed in accordance with criteria, conditions and methods specified in the course descriptions, applying them consistently. To provide guidelines for the procedure of writing and defending annual projects and graduation papers, the following document is prepared and approved: Guide for Preparation and Defence of Study Projects and Graduation Papers. The composition of the State Examination Commission is approved by the Assembly of the Faculty; specialists/experts of the field are included in the commission and they follow methodological guidelines for the preparation of graduation papers. Internships within the study programmes are regulated by the Internship Regulations which lay down the procedure of internship, conditions for writing and defending reports.

The diversity of student needs is respected in the study process at ViA by choosing appropriate learning approaches. ViA uses innovative teaching methods and implements an individual approach. Directors of the study programmes make sure that lecturers involved in the implementation of the programme have a good knowledge of the methods of assessing learning outcomes and receive support for the development of their skills in this area; assessment criteria and methods, as well as evaluation criteria are made public in advance; evaluation provides for a possibility to show the extent to which students have achieved learning outcomes; students receive feedback from lecturers who provide advice on the studies and research process, if necessary; assessment is consistent, fair to all students and is carried out in accordance with the approved course descriptions.

Appropriate procedures – ViA Study Regulations and the Regulations of Ethics – are in place for resolving student complaints. The learning environment moodle.va.lv provides students with an opportunity to get to know academic progress evaluation criteria, conditions and binding procedures.

Refer to the annex for ViA Study Regulations (see Annex 12).

Refer to the annex for ViA Regulations of Ethics and the Ethics Violation Scheme (see Annex 13).

Course descriptions, Internship Regulations and methodological guidelines for writing graduation papers are appended after the description of each study programme.

2.1.6. Description and assessment of the academic integrity principles, the mechanisms for compliance with these principles, and the way in which the stakeholders are informed. Specify the plagiarism detection tools used by providing examples of the use of these tools and mechanisms.

Principles of academic integrity are laid down in ViA Regulations of Ethics approved on 26 April 2017 at ViA Senate meeting.

The Regulations of Ethics define basic principles and norms that ViA personnel (students, academic and general staff) must observe in their attitude towards ViA, in their work, in their relations with other ViA representatives and society.

The Regulations of Ethics also include a section on academic and research ethics stating that ViA staff treats the study and research process and personnel involved therein with integrity. In academic and scientific research, the staff complies with copyright, respects intellectual property, honours work results of others, and guarantees the truthfulness of the data used and analysis performed in research.

In order to promote the observance of academic and research ethics at Vidzeme University of Applied Sciences, the following principles must be adhered to: integrity, openness, objectivity, unambiguity, observance of the rights of research participants, independence from sponsors; the contribution to research by all involved persons must be acknowledged.

The Regulations of Ethics list the types of violations of academic and research ethics indicating that plagiarism, falsification, the use of unauthorized sources and ways of obtaining information during examinations (exams, tests), re-submission of one's own work to another study course without a prior agreement with the lecturer, as well as any other deliberate engagement in the activities that hinder or interfere with the study process and academic work at the institution of higher education, including participation in or concealment of violations of academic ethics shall be deemed to be a violation of academic ethics. Furthermore, the following is considered to be a violation of research ethics: violations of requirements of research ethics specified in the professional codes; allowing conflicts of interest; data falsification; tendentious data analysis and interpretation; discrimination of research participants; disregard of voluntary participation in research; disregard of participant anonymity or confidentiality (as appropriate), except the cases when these issues are harmonized with research participants or data are collected in public environment (for example, observation in public environment); violation of informed consent, unless it is a simple observation in a public place and the audio or video recording is not used in a way allowing identification of or harm to a person; misleading or failure to inform the subjects of the research on the purposes or significant aspects of research, unless it is not possible to use other effective alternative methods; misleading society without providing complete information; plagiarism and self-plagiarism, i.e., failure to refer to previously published data or discoveries; use of data collected by other researchers without a reference to the contribution of other authors.

The regulations also clearly define sanctions for ethical violations, as well as the procedure for identifying violations and imposing sanctions.

Sanctions for the violations of research ethics may be initiated by the Academic Ethics Commission. Sanctions for the violation of the norms of academic ethics may be imposed on students by a lecturer or the Rector in accordance with the decision of the Academic Ethics Commission. Sanctions for the violations of the norms of academic ethics may be imposed on academic and general staff by the Rector in accordance with the decision of the Academic Commission. Sanctions for the violations of general ethical principles may be imposed on the general staff (including academic staff if the violation is not related to academic work) by the employee's immediate supervisor or the Rector.

Starting from 2017, ViA has entered into the agreement with the University of Latvia on the use of the *Unified Computerized Plagiarism Control System*, one of the most essential anti-plagiarism tools at ViA. In accordance with the order which is issued every semester regarding submission of the graduation papers (including the Qualification papers), students have to upload their papers to the study information system LAIS which is synchronized with the plagiarism control system. In situations where a lecturer has suspects regarding student's paper, the plagiarism control system is also used to check course papers or annual projects. In 2018, by the help of this system, a case of plagiarism of the Qualification paper was detected, as a result of which the student re-wrote the paper in the following academic year.

Refer to the annex for ViA Regulations of Ethics and the Ethics Violation Scheme (see Annex 13).

2.2. Efficiency of the Internal Quality Assurance System

2.2.1. Assessment of the efficiency of the internal quality assurance system within the study field by specifying the measures undertaken to achieve the aims and outcomes of the study programmes and to ensure continuous improvement, development, and efficient

performance of the study field and the relevant study programmes.

A system for the quality management of internal processes has been developed and implemented. Its purpose is to describe, assess and improve administrative and study-related processes. Administrative processes are monitored in weekly meetings attended by the Directors of programmes and study specialists. If necessary, other administrative employees such as representatives of the study administration group are involved, and they help solve problems related to the study process (if any). Furthermore, the meetings of the Directors of the study programmes are held once a month where current issues related to studies are discussed. The processes related to the provision of studies are summarized, structured and made available to employees on the MS SharePoint website created by the faculty.

The planning of administrative tasks and tasks for the implementation of the study programmes takes place in the MS Planner environment, which allows to promptly monitor the list of tasks to be performed, the deadlines for the various parties involved, and responsible persons.

The quality of the study process and content is assessed at several levels: 1. evaluation of the course descriptions and assessment of their compliance with the Occupational Standard; 2. course assessment questionnaires filled in by students regarding the lecturer's performance and course content; 3. discussions with students several times per semester; 4. discussions with industry representatives – internship providers and employers.

Course descriptions are assessed in accordance with the requirements of the Occupational Standard for each study programme. Course descriptions are placed on moodle.va.lv under the relevant course section, thus they automatically become available to students as soon as they have registered for the relevant course – in this way, information on the course content, topics and assessment criteria is available to students.

After examining course assessment questionnaires, a decision is taken to discuss possibilities of improving the study content or the quality of the study course implementation with the relevant lecturer. The Director of the study programme, Dean and study specialist participate in the assessment. During discussions, the lecturer is expected to provide an oral explanation of the poor assessment, possible causes and the planned measures for the implementation of remedial actions.

The Faculty of Engineering has introduced open "meetings with the Dean" – regular meetings twice a semester, during which students have the opportunity to express their opinion about the study process, the environment and other topical issues. Such feedback ensures prompt identification of problems and activities to address them in order to find a solution before the end of the semester. Likewise, during introductory studies, students are informed of their involvement in and responsibility for improving the quality of the study process; this procedure consists of three steps: 1. the problem identified is discussed with the lecturer and a solution is found in discussions between students and lecturers; 2. if the identified problem is not resolved in discussions with the lecturer, the Director of the programme is involved in problem solving; 3. if the issue is not resolved even after being discussed with the Director of the programme, the issue is discussed at the Dean's level, involving also representatives of the study administration group if necessary.

Discussions with industry representatives are organized at least once a year within the Advisory Council of each programme, as well as with individual company representatives as needed.

2.2.2. Analysis and assessment of the system and the procedures for the development and

review of the study programmes by providing specific examples of the review of the study programmes, the aims, and regularity, as well as the stakeholders and their responsibilities. If, during the reporting period, new study programmes have been developed within the study field, describe the procedures of their development (including the process of the approval of study programmes).

Vidzeme University of Applied Sciences has developed the procedure for study programme developing (ViA Study Quality Assurance Policy, Annex 2 - see Part I, Section 1.3), approving and monitoring. This procedure lays down guidelines for the development, approval, monitoring and updating of the study programmes, lifelong learning courses and other curricula and components thereof. The programmes and components thereof are elaborated to meet the objectives set, which, in turn, are in line with the ViA strategy. Programmes are developed using the vision of external stakeholders in such a way to meet the study results defined and to ensure compliance of the learning outcomes with the Latvian and European Qualifications Framework, and to promote higher education goals – to promote personal growth and employment, the formation of civil society and the expanded knowledge base.

One of the factors helping provide the quality assurance of the study programmes is regular (once a semester) communication with industry companies, study programme graduates to obtain feedback on the compliance of the study programme content with the industry demand. As a result of such discussions, a vision of the necessary skills of potential employees and development tendencies of the industry is made clear.

The information obtained is passed on to the teaching staff of the faculty, as well as to the members of the Advisory Council, calling them to a discussion on the possible/necessary changes to the study programmes. For example, improvements were made to the Bachelor's programme "Information Technologies" based on the labour market demand and pursuant to the results of discussions with employers.

During the development of the Bachelor's programme "Mechatronics" in 2017, the labour market demand and professional study programmes in the field of mechatronics implemented in Latvian higher education institutions were analyzed. The professional college level study programme "Mechatronics" has been implemented at the Faculty of Engineering of ViA since 2008. In order to ensure the continuity of the professional first-level higher education programme "Mechatronics" and in accordance with the development strategy of the study field, the faculty identified the need to develop a professional Bachelor's programme "Mechatronics". The development of the study programme corresponded to the strategy of Vidzeme University of Applid Sciences for 2016-2020. The programme has been developed in cooperation with specialists of Latvian companies, as well as with the support of large regional employers in the field of mechatronics.

On 7 December 2015, ViA received a letter No. 1/12.82 from the Council of Higher Education on the development of study programmes in the field of cyber security. In the letter, the Council of Higher Education explained amendments of 2014 to the guidelines "Cyber security strategy of Latvia for 2014-2018", where Clause 1.19 of the first section "Cyber security management and resources: National cyber security" provides for the task of preparing highly qualified managers in the field of cyber security by creating appropriate educational programmes. The Council of Higher Education is responsible for the implementation of this task in cooperation with higher education institutions. The letter also asked whether ViA would be ready to develop a study programme that would prepare highly qualified managers in the field of cyber security. Referring to this letter, the Assembly of the Faculty of Engineering replied that Vidzeme University of Applied Sciences was

ready to introduce specialization in the field of cyber security in the IT undergraduate programmes. And in 2017, the study field started working on the development of the study programme, inter alia, consulting with industry specialists and employers.

The development of the professional Master's programme "Virtual Reality and Smart Technologies" in 2017 was a clear continuation of the specialization started by Vidzeme University of Applied Sciences in the field of augmented reality and relates to the desire to continue the development of this field, based on the observance of the principles of succession. The beginning of the development of the field of VR/AR at ViA can be traced back to 2009, when the Virtual Reality Technology Laboratory was established. The activity was implemented in cooperation with the Virtual Reality Training and Development Center of Fraunhofer Institute (Magdeburg, Germany) and the University of Agder (Kristiansand, Norway). Since then, several projects and research have been carried out in the fields of tourism, history, art, food processing, architecture, medicine and logistics. Academically, before the development of a separate Master's programme in virtual and augmented reality, the study course "Virtual and Augmented Reality Technologies" was approbated within the professional Master's programme "Sociotechnical Systems Modelling", as well as within the professional Bachelor's programme "Information Technologies". Until now, the study programme "Virtual Reality and Smart Technologies" has been successfully implemented since 2017, admitting students almost every year (except for the academic year of 2019/2020). Graduates of the study programme write and defend their State qualification papers, receiving top grades. The graduation papers feature the topics of virtual and augmented reality, solving important challenges for society and industry and creating technologically innovative solutions. The results of the developed papers have been demonstrated and presented at various events: scientific conferences and seminars, public events organized by the municipality of Valmiera city, activities organized by ViA Marketing Department, events of Researchers' Night, etc.

The study programme is developed based on the best practices adopted from the universities and scientific institutions that implement programmes of similar content and with which ViA and the lecturers involved in the study programme cooperate, for example, the University of Salento in Italy, the University of La Laguna in Spain, and the University of Skovde in Sweden. During the development of the programme, industry partners such as Overly, Accenture, LMT, AnatomyNext, Modern Media were also interviewed, as well as representatives from such companies as Giraffevisual, Vividly and 360video were interviewed during personal conversations. It helped adapt the study programme to the requirements of the region. Within the framework of the implementation of the study programme, there is an active cooperation with SIA Exonicus, Exonicus Ltd., the latest findings and recommendations are integrated into the content of the programme, meetings of the Advisory Council of the study programme are hold on a regular basis, in which student representatives, representatives of the industry participate (SIA Anatomy Next, Riga Innovation Group, SIA Vividly, SIA Overly, SIA Accenture). At the same time, an in-depth cooperation agreement was entered into with SIA Exonicus in 2022, thus ensuring more effective integration of the needs of the industry in the programme content.

The study quality assurance policy document is available on the ViA website: https://va.lv/sites/default/files/5P-ViA_Studiju-kvalitates-nodrosinasanas-politika-APST-31012020-ENG.pdf

2.2.3. Description of the procedures and/or systems according to which the students are expected to submit complaints and proposals (except for the surveys to be conducted

among the students). Specify whether and how the students have access to the information on the possibilities to submit complaints and proposals and how the outcomes of the examination of the complaints and proposals and the improvements of the study field and the relevant study programmes are communicated by providing the respective examples.

The rights and interests of ViA students are represented by the Student Union of ViA – an independent, elected institution whose representatives participate in improving the quality of studies and internal processes of ViA, as well as in planning and implementing future progress. The Student Union is represented in the Assembly of the Faculty, Senate, Senate commissions, the Constitutional Assembly, as well as in the Development Commission. Besides, students are also represented in the Advisory Councils of each study programme.

Students can file claims and complaints individually to the study programme secretary or study specialist, who then passes them on to the Director of the study programme, or the claims and complaints can be directly submitted to the Director of the study programme, who assesses the complaint received and provides feedback to the claimant about the further actions regarding the complaint/application. Complaints can also be forwarded through the Student Union, which then files them for consideration at the meeting of the Assembly of the Faculty.

The Director of the study programme, after examining the content of the complaint, promptly responds to it and calls the parties involved to a conversation in order to find a solution to a specific problem. Students receive information on complaints and proposals filed from the head of the particular student group and/or representatives of specific fields.

Within the framework of the study field, at the end of each semester, the Directors of the study programmes organize discussions with the students about the study process quality – in this way students provide feedback on the study process as a whole, make suggestions for process improvement, as well as point out to shortcomings. The Director of the study programme summarizes things discussed and provides information to the Dean of the faculty and, if necessary, also to the teaching staff involved in the study field. Problems are analysed, solutions are prepared, persons responsible for the implementation of the solution are appointed, and then feedback on the solution, problem solving status and progress is given to the students.

Apart from the end-of-semester discussions, since spring 2021, student discussions with the Dean are organized once or twice a semester within the framework of the study field – the purpose of discussion is to find out the opinion of students, to listen to it, to obtain information about the processes that need improvement in a timely manner.

The quality of the study process and content is assessed at several levels: 1. evaluation of the course descriptions and their compliance with the professional standard; 2. course evaluation questionnaires filled in by students on the performance of the lecturer and the course content; 3. end-of-semester discussions with students, which are held at the end of each semester and are convened as needed if students indicate a need; 4. discussions with industry representatives - both companies that provide internships and employers.

For example, the interviews with students revealed that students are not clear about the processes related to the implementation of their studies - who to contact to solve a particular issue, who is the responsible person for a particular process, where to find samples of applications, etc. As a result, an information material for students - Student's Journey - was developed, which provides an informative overview of the processes related to studies and the person responsible for each

process, including the communication channels.

In general, communication within the study field regarding resolving disputes and ambiguities, as well as filing of proposals can be assessed as open and operative.

In the event of a complaint about academic work or an assessment, the student has the right to appeal (to request a reassessment). The procedure for submitting an appeal is laid down in the ViA Study Regulations.

2.2.4. Provide information on the mechanism for collecting the statistical data, as developed by the higher education institution/ college. Specify the type of data to be collected, the regularity of collection, and the way the information is used to improve the study field. Describe the mechanism for obtaining and providing feedback, including with regard to the work with the students, graduates, and employers.

To make decisions about the development and improvement of the study field programmes, various student profile data and student number statistics are taken into account. Statistical reports are compiled as necessary, distinguishing between mandatory (in accordance with the Cabinet Regulations) and optional statistics (as needed); the information to be collected is analysed according to the purpose stated in the decision. Statistical data reports on applicants, the number of students and graduates are prepared on a regular basis.

Table No.2. *Types of statistical data reports compiled by ViA*

Type of statistics	*Regularity*	*Profile (upon request)*	*Necessity*	*Statistics are compiled by*
Applicants	After each admission and upon request	Number of applicants; Place of residence; Educational institution; Number of applications; Admission competition; Funding, etc.	Admission analysis; Admission planning; Planning of marketing activities; Improvement of the programme; Planning of budget places; Self-assessment reports, etc.	Study administration group
Students	Each month and upon request	Number of students; Funding; Average and weighted grades; Drop-out, etc.	Improvement of the programme; Planning of budget places; Self-assessment reports; Rotation; Scholarships, etc.	Study administration group
Graduates	After graduation and upon request	Number of graduates; Funding; Average and weighted grades; Topics of graduation papers	Improvement of the programme; Planning of budget places; Self-assessment evaluation reports, etc.	Study administration group

Surveys of applicants, students and graduates are an important source of information for the improvement of programmes of the study field. On the basis of the applicant surveys, it was decided to improve marketing activities, for example, by launching individual activities for college programme students in the summer of 2019 because the overall direction of ViA marketing

campaigns was focused on attracting undergraduate students.

Student surveys at the end of each study course allow the lecturer to assess the course and results achieved, as well as student satisfaction. The questionnaire includes questions about the course topics and their relevance to the particular course, the usefulness of acquired skills and knowledge, assessment of the importance of lectures, practical assignments and independent work, availability of the lecturer (consultations, responsiveness), assessment of technical support, as well as a possibility to freely submit one's recommendations for the course improvement. In the section on the assessment of the lecturer's work, students assess the lecturer in terms of their professional competence, ability to arouse interest in the course, ability to connect theory with practice, work organization skills, attitude towards students, etc.

Directors of the study programmes monitor the progress of study courses and, if necessary, initiate changes (for example, to change the course lecturer, to clarify the course content, to change the amount of credits for a particular course, to change the placement of the course in the study programme plan, etc.). Problem issues are discussed at the stages intended for ensuring the study programme quality. Based on the students' assessment, lecturers were changed in the Cybersecurity Engineering courses of the Master's programme.

Responses also allow assessing the course, its content and cooperation between the lecturer and students. The open questions point to the lecturer's strengths/weaknesses, which would require additional attention. Students appreciate practical assignments and discussions within the study courses. In general, the overall evaluation of study courses ranges from 3.5 to 5 points (the maximum number of 5 points). The average rating for all courses as a whole is 4.3, which indicates high student satisfaction with the overall quality of studies.

In order to improve the quality of studies, in 2021, the content of the course assessment questionnaire for students was completely revised, and we started working on a new student registration procedure, namely, students can complete registration for the next study semester by filling out all the study course assessment questionnaires of the relevant semester. In order to implement the new procedure, the Study Information System (LAIS) was improved and programming has been carried out to ensure student feedback on the content, organization, material-technical base and informational provision of the study programmes, support system for students, and other internal quality assurance aspects of the study programme, as a result of which it would be possible to make relevant proposals for the improvement of the study programme.

Vidzeme University of Applied Sciences regularly conducts graduate surveys (9 months after graduation). Unfortunately, one of the challenges is the involvement of graduates in filling out surveys – in 2021, answers were received from only 21% of VIA graduates surveyed of which 36% were directly from the graduates of the study field programmes. 80% of the respondents indicated that they work full-time – 53% in the private sector, 40% in the governmental and municipal institutions and 7% in the public sector. The vast majority of respondents (87%) stated that they use the knowledge gained during their studies in their professional work. This could be one of the indicators that show that the knowledge provided by the study programmes is of sufficient quality and practically relevant to the labour market.

Although the graduates of the study field programmes are reluctant to fill out the graduate surveys, we have found out from informal conversations with them that most of them after graduation work in the industry, especially it applies to those who have graduated from the Master's programmes as they are employed 100%.

Additional changes have been made to the study programme based on data assessment, formal and informal meetings with industry entrepreneurs, and the internal quality system.

Graduates and employers participate in the work of the study field Advisory Councils both formally and informally, as well as in the defence of internships and graduation papers, where they also provide their recommendations for improving the course of studies and internships, thus constantly ensuring the improvement of the quality of studies and interconnectedness with the needs of industry.

Refer to the annex for the analysis of the student, graduate and employer survey results (see Annex 14).

2.2.5. Specify the websites (e.g., the homepage) on which the information on the study field and the relevant study programmes is published (in all languages in which the study programmes are implemented) by indicating the persons responsible for the compliance of the information available on the website with the information published in the official registers (State Education Information System (VIIS), E-platform).

Information about ViA study fields and offered study programmes is published on the ViA website *www.va.lv*. The Administrative Department of ViA is responsible for making information publicly available (on the homepage – the Marketing group; on other websites – the Study administration group).

Information Technology:
https://va.lv/en/study-here/bachelors-degree/information-technologies/about-programme

Mechatronics: **https://va.lv/lv/studijas/bakalaurs/mehatronika/par-programmu** (at the moment Latvian only)

Cybersecurity Engineering:
https://va.lv/en/study-here/masters-degree/cybersecurity-engineering/about-programme

Virtual Reality and Smart Technologies:
https://va.lv/en/study-here/masters-degree/virtual-reality-and-smart-technologies/about-programme

Sociotechnical Systems Modelling (Socio-technical Systems Engineering):
https://va.lv/en/study-here/phd-degree/sociotechnical-systems-modelling/about-programme

2.3. Resources and Provision of the Study Field

2.3.1. Provide information on the system developed by the higher education institution/ college for determining and redistribution of the financial resources required for the implementation of the study field and the relevant study programmes. Provide data on the available funding for the scientific research and/or artistic creation activities, its sources and its use for the development of the study field.

Table No.3. *Financial resources for the implementation of the study programmes relevant to the*

study field from 2014 to 2022.

Funding/Year	2021	2020	2019	2018	2017*	2016	2015	2014
State budget funding for the study field (without funding for scholarships), EUR	668016	658397	672832	636495	696 150	457 797	423176	371132
Own income – study field tuition fees, EUR	81345	74625	51692	63781	73 274	79983	64 105	55 421
Funding, total	**749361**	**733022**	**724524**	**700276**	**769424**	**537780**	**487281**	**426553**

* *the item "Engineering and Architecture" is included in the calculation*

Funding for research activities at Vidzeme University of Applied Sciences is not divided by the study fields, but is directed to scientific institutes, grant programmes, research projects and commissioned works in which academic staff from different study fields works.

Table No.4. *Funding for research/(creative) activities of the academic staff.*

Funding/Year	2021	2020	2019	2018	2017	2016	2015	2014
Base funding for science	159 639	152 575	147 790	142 725	124 321	13 222	42 084	36 498
Funding for the State research programmes	126 430	471 050	325 099		82 811	56 119	9 453	
Funding for research grants allocated by Valmiera city municipality	0		15 000	20 000	20 000	20 000	22 500	22 500
EU Structural Funds	319 971	288 424	295 163	534 951	510 796			19 209
Grants and programmes of the Latvian Council of Science	199 326	22 953					1500	
Other income for science from the State budget (including research commissioned by the State administration institutions)	615 291	301 117	132 586	25 951	61 046	97 095		
Funding for the development of scientific activity	191 713	197 011	181 806	150 240	122 192	24 514	19 743	

Income from contracts with legal entities of the Republic of Latvia	87 091	87 830	86 257	101 209	5 785	36 200	4 658	3699
Other income for research activities	232		696		2180		1900	
Income from foreign financial assistance	229 963	677 204	337 613	111 259	28 756	20 372	32 177	29 898
Total	**1 929 656**	**2198164**	**1522010**	**1086335**	**957 887**	**267 522**	**134 015**	**111 804**

Funding for student self-government is provided in the amount of at least one-twentieth of the State funding for the study process and of income from tuition fees.

Table No.5. *Funding for student self-government during the reporting period.*

Funding/Year	2021	2020	2019	2018	2017	2016	2015	2014
EUR	7691	7470	7470	7470	7173	6958	6958	7413
Student self-government funding ratio, %	0.53	0.5	0.51	0.52	0.51	0.52	0.51	0.52

Vidzeme University of Applied Sciences applies its own calculation methodology to calculate student costs, according to which costs are classified as follows:

Table No.6. *Compliance of the remuneration of the academic staff with the regulations on the remuneration of teachers*

Year	Position	Monthly salary rate *	Minimum hourly rate **	ViA hourly rate ***	Compliance
2021	Professor	1754	17.54	17.54	complies
	Associated professor	1404	14.04	14.04	complies
	Assistant professor	1124	11.24	11.24	complies
	Lecturer	900	9.00	9.00	complies
	Assistant	717	7.17	7.17	complies

2020	Professor	1569	15.69	15.69	complies
	Associated professor	1256	12.56	12.56	complies
	Assistant professor	1005	10.05	10.05	complies
	Lecturer	805	8.05	8.05	complies
	Assistant	641	6.41	6.41	complies
2019	Professor	1530	15.30	15.36	complies
	Associated professor	1225	12.25	12.27	complies
	Assistant professor	980	9.80	9.82	complies
	Lecturer	785	7.85	7.85	complies
	Assistant	625	6.25	6.30	complies
2018	Professor	1411.76	14.12	14.49	complies
	Associated professor	1130.17	11.3	11.58	complies
	Assistant professor	904.23	9.04	9.26	complies
	Lecturer	723.96	7.24	7.41	complies
	Assistant	576.98	5.77	5.94	complies
2017	Professor	1293.53	12.94	13.17	complies
	Associated professor	1035.351	10.35	10.53	complies
	Assistant professor	828.47	8.28	8.42	complies
	Lecturer	662.91	6.63	6.74	complies
	Assistant	528.95	5.29	5.4	complies
2016	Professor	1175.29	11.75	12.54	complies
	Associated professor	940.52	9.411	0.03	complies
	Assistant professor	752.7	7.53	8.02	complies
	Lecturer	601.87	6.02	6.42	complies
	Assistant	480.93	4.81	5.14	complies

2015	Professor	1175.29	11.75	12.54	complies
	Associated professor	940.52	9.41	10.03	complies
	Assistant professor	752.7	7.53	8.02	complies
	Lecturer	601.87	6.02	6.42	complies
	Assistant	480.93	4.81	5.14	complies
2014	Professor	1175.29	11.75	12.54	complies
	Associated professor	940.52	9.41	10.03	complies
	Assistant professor	752.7	7.53	8.02	complies
	Lecturer	601.87	6.02	6.42	complies
	Assistant	480.93	4.81	5.14	complies

* - Cabinet Regulations No. 445 “Regulations Regarding Remuneration of Teachers” as of 01.09.2021

** - calculated taking into account the maximum workload of academic staff – 1000 hours per year (100 hours per month) laid down in the Cabinet Regulations No. 445 “Regulations Regarding Remuneration of Teachers”

*** - approved at the ViA Senate meeting on 24 February 2021, decision No. 2/2.1

Vidzeme University of Applied Sciences applies its own calculation methodology to calculate student costs, according to which costs are classified as follows:

Direct costs – direct costs of the study programme implementation:

- academic staff remuneration,
- costs of teaching materials, events,
- other direct costs related to the implementation of the study programme.

Semi-direct costs – direct costs of the study field and faculty:

- remuneration for academic staff which is not directly related to the implementation of a study programme (e.g., remuneration for scientific work of faculty lecturers),
- costs of administrative work of the study field and faculty (remuneration for dean, head of the study field, senior specialist),
- other administrative costs of the study field and the faculty (costs of faculty staff business trips, costs of training, attending conferences, membership fees, costs of stationery, hospitality and other expenses),
- development expenses (usage of funding directly intended for the development of the faculty or study field),
- cost carrier – the number of students per faculty (for transfer of direct costs of the faculty) or the number of students per study field (for transfer of direct costs of the study field).

Indirect costs – other costs of ViA:

- remuneration (remuneration for administrative, general and operational staff),

- administrative costs (expenses for business trips, total expenses for study process organization, technology expenses, library expenses, marketing, public relations and event organization expenses, other administrative expenses),
- building management costs (infrastructure maintenance and operation costs),
- loan repayment costs,
- capital expenditure (books, equipment),
- cost carrier – the number of students per programme (for transfer of remuneration, administrative and capital costs) or the number of contact hours of the study courses implemented within the study programme per year (for transfer of building management costs).

Information on costs per student indicates items included in the cost calculation and distribution of funding (in percentage) between the items specified.

Table No.7. *Distribution of funding between the defined positions during the reporting period.*

	2021	**2020**	**2019**	**2018**	**2017**	**2016**	**2015**	**2014**
Cost headings	%	%	%	%	%	%	%	%
Direct costs								
Costs of academic and scientific work (study process)	40.9	31.7	41.4	37.5	39	37.9	38.8	33.1
Other costs of the study process	1.4	0	0.3	0	0.6	2.3	3.1	3.6
Semi-direct costs (transfer of the direct costs of the study field, faculty)								
Remuneration for scientific work (academic leave + scientific work)	0.6	0.9	1.1	0.5	1.2	3.4	0.8	5.1
Administrative work	14.7	17.5	12.5	11.6	9.4	8.1	8.4	8.4
Other administrative costs	1.3	0.7	1.8	0.3	1.4	1.9	0.6	1
Total direct costs (direct + semi-direct)	**58.9**	**50.8**	**57.1**	**49.9**	**51.6**	**53.6**	**51.7**	**51.2**
Indirect costs (transfer of other ViA costs)	**41.1**	**49.2**	**42.9**	**50.1**	**48.4**	**46.4**	**48.3**	**48.8**
Remuneration	23.9	30.8	24.5	29.8	26.4	25	27	29.7
Other administrative expenses	7.3	9.4	7.8	9.2	9	9.6	7.2	10
Loan repayment (including, interest payments)	1.4	1.8	1.4	1.8	2.1	2.3	2.2	1
Capital expenditure	0.8	0.7	0.8	0.9	0.8	0.5	0.8	1.5

Costs of building management	7.7	6.5	8.4	8.4	10.1	9	11.1	6.6
Costs per 1 student	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

For the development of the study fields of the faculty, additional funding is allocated from the ViA budget – development grant for the Faculty of Engineering – in the amount of EUR 10,000 per year. The grant is distributed among the study programmes of the faculty as needed. In addition, financing for the purchase of teaching aids in the amount of EUR 2,500 and financing for field trips in the amount of EUR 300 per year is allocated.

Control and sustainability of the use of financial resources

Control and sustainability of the use of financial resources are laid down in the procedure for development, approval, execution and control of the budget of Vidzeme University of Applied Sciences (approved on 26 October 2011 at the ViA Senate meeting, decision No. 10/7.1)

Refer to the annex for the information about the costs of each study programme (see Annex 15).

2.3.2. Provide information on the infrastructure and the material and technical provisions required for the implementation of the study field and the relevant study programmes. Specify whether the required provision is available to the higher education institution/ college, available to the students, and the teaching staff.

ViA has two buildings in Valmiera – at Cēsu Street 4 and Tērbatas Street 10 – for the study process, research and administrative activities with the total area of 71312 m^2 at the disposal of ViA, of which 2387 m^2 are used directly for the study process and research. The current study base consists of 38 lecture-rooms (total area of 1445 m^2), including 3 computer classrooms with 90 workstations and the Internet connection (195 m^2), as well as a fixed projector, loudspeakers and a multifunctional remote control for presentations. Interactive boards are available in two lecture-rooms. All staff workplaces are equipped with desktop computers; there are 10 laptops available for on-site use upon request.

There are 5 laboratories available for the implementation of the study process – Computer Network Laboratory, VR/AR Laboratory, Electronics and Electrical Engineering Laboratory, Mechatronics Laboratory, and Mobile Technology Laboratory (total area of 324 m^2).

The following laboratories are necessary for the implementation of study programmes:

Electronics and Electrical Engineering Laboratory – laboratory equipment provides for a possibility to perform various measurements of direct and alternating current, as well as to perform experiments with various direct and alternating current circuits. In the laboratory, students learn the following: fundamentals of electrical engineering and the operation of electrical circuits; fundamentals and elements of analogue and digital electronics; fundamentals of power electronics; development and debugging of electrical circuits; electrical measurements; programming and process control using microcontrollers.

Computer Network Laboratory – laboratory equipment provides for a possibility to assemble and disassemble computers. It is possible to install a small network, starting from the lowest level – cable installation. Upon installing a network, students can use both local and global computer

network technologies. Students have the opportunity to work with equipment from world-renowned hardware manufacturers, including Cisco and Mikrotik, to install and test a network, as well as to certify it using hardware specifically designed for this purpose.

Virtual and Augmented Reality Laboratory – laboratory equipment provides for a possibility to create various virtual and augmented reality projects. Traditional input devices are replaced by three-dimensional manipulators, data gloves, joysticks, touch-sensitive surfaces, gestures, hand or head position tracking devices, etc. Instead of traditional visual output devices, stereoscopic screens, CAVE systems, head displays or projection walls are used. The latest VR/AR system authoring platforms and CAD software are used in the design of interactive and training systems.

Mechatronics Laboratory – equipment is used for the following study courses: Fundamentals of Electric Machinery, Electric Drive, Electropneumatics, Automation, Programming of Programmable Logic Controllers, Visualization of Technological Processes, and is also used for conducting experiments.

Mobile Technology Laboratory – laboratory equipment provides for a possibility to create mobile apps for Android, iOS and Windows environments. The Mobile Technology Laboratory is a place where students, pupils and anyone interested, using the latest and most advanced technologies of the future, conduct experiments and create useful, educational, entertaining online and offline solutions for schools, sports and recreation enthusiasts, tourists, companies and municipalities, etc.

The number of computers available:

for students – 160 pcs;

for academic staff – 45 pcs;

for administrative staff – 60 pcs;

The number of desktop computers in the lecture-rooms – 30 pcs (apart from computer classes);

Laptops – 60 pcs;

Multimedia projectors – 45 pcs.

Students are provided with access to the following specialty software used in training programmes – Blender, Android Studio, CocoaPods, CodeBlocks, Eclipse EE, Enterprise Architect, Python, Nodejs, PSPP, Unity, Visual Studio.

2.3.3. Provide information on the system and procedures for the improvement and purchase of the methodological and informative provision. Description and assessment of the availability of the library and the databases to the students (including in digital environment) and their compliance with the needs of the study field by specifying whether the opening times of the library are appropriate for the students, as well as the number/ area of the premises, their suitability for individual studies and research work, the services provided by the library, the available literature for the implementation of the study field, the databases available for the students in the respective field, the statistical data on their use, the procedures for the replenishment of the library stock, as well as the procedures and possibilities for the subscription to the databases.

Funding for Vidzeme University of Applied Sciences library collection is not divided by the study fields because during the study process the library resources are often used by students of several study fields. The most important items within each course are renewed on a cyclic basis, while the most current items of additional literature are purchased on a regular basis.

Table No.8. *Expenses for the development of library collection (EUR).*

	2021	2020	2019	2018	2017	2016	2015	2014
Periodicals	1573	1623	1865	2218	1955	1930	2077	2923
Books	8502	7303	10 849	14 470	17 954	5873	4394	9828
Electronic documents and databases	5535	523	3068	2789	2870	4373	468	19 251
Total:	15 610	9449	15 782	19 477	22 779	12 176	6939	32 002

The library is open to readers 51 hours per week. ViA students and lecturers have remote access to databases and electronic catalogue 24/7. The library is also accessible for people with physical disabilities. The library provides all the traditional library services. Information about resources and services available at the library can be found on Vidzeme University of Applied Sciences website under the section library https://va.lv/en/students-and-employees/library/about-library

On the 1st floor reading room (455.10m^2) students have access to 130 units of periodicals in Latvian, Russian, English and German in a paper format of which 34 units are subscribed by ViA library. Fiction and archive of selected periodicals are also available.

On the 2nd floor, there is a computerized reading room (67.80 m^2) with 18 work stations, 4 more work stations are in the main room. The computers have also PSPP data processing programme. Furthermore, there are two reading rooms (14.50 m^2 each) for group work, four individual reading rooms (5.20 m^2 each), and a quiet reading room (79.20 m2) on the second floor. The area of the second floor library is 776.00 m^2. There one can find specialised literature, a collection of local history of Valmiera city and surrounding municipalities, as well as the European Commission information centre Europe Direct that provides information on the European Union, as well as the archive of the best scientific papers by ViA students. For the convenience of users, a “silence booth” has been installed for telephone or skype calls, where louder conversations are possible without disturbing other library visitors. All processes of ViA library are automated by means of the library information system ALISE. Since January 2006, there is an i-library available providing for a possibility to order books from the electronic catalogue of Valmiera Integrated Library, to book those items that are already lent, to extend the lending period for books, to view data on the books lent/not returned on time/booked.

Since spring 2015, the mobile version of the library information system ALISE is available. Thus, the electronic catalogue is also easily accessible from the mobile devices. To provide high quality support to VIA education and scientific process, the library offers individual consultations, tours and group training to students, academic staff and other interested parties. Educational activities are organized by the specialists of both ViA Library and Valmiera Library. The goal of training is help new students to get to know Valmiera Integrated Library and its services, to show how to work with the library’s electronic catalogue and subscribed online full-text electronic databases. It is possible to apply for a training session also electronically.

In the academic year of 2019/2020, the first year students had 15 introductory lectures on the

library and its services, students got acquainted with electronic catalogues and information search in the databases available in Valmiera Integrated Library and remotely accessible resources of the National Library of Latvia.

The library offers an Interlibrary Loan Service (ILS) free of charge as it is provided in cooperation with Valmiera Library.

The total number of ViA Library documents (physical units) in August 2022 was 27952 units of which:

- books – 22032,
- electronic documents – 352,
- audiovisual documents – 481,
- cartographic documents – 99,
- serial publications – 2000,
- unpublished documents – 2988.

Subscribed databases

Full-text databases: EBSCO, ScienceDirect, Scopus, Web of Science. Besides, Travelnews.lv, Lursoft, i-finanses and i-law are also available. In collaboration with Valmiera Library, readers have access to the following databases: Britannica Online Library Edition, EBSCO eBook Public Library Collection, LETA Archive, nozare.lv, Letonika, "Lursoft" newspaper archive, as well as a collection of DVDs. Mostly, databases are available from all computers operating in ViA data transmission network. Individual databases may be accessed only on-site at the library with a special permission (Lursoft, i-finanses, i-law).

ScienceDirect is one of the world's largest databases of scientific, technical, and medical articles, covering the full text of Elsevier Science journals. Thematic coverage: Exact sciences, technical sciences, social sciences and humanities

EBSCO – is a multidisciplinary database platform of e-books, e-journals and other e-resources, consisting of several full-text and review databases. Thematic coverage: Humanities, social sciences, exact sciences and natural sciences (politics, history, psychology, philosophy, ethics, geography, biology, chemistry, mathematics, physics, etc.)

Web of Science is a leading electronic resource research platform developed by Clarivate Analytics. A single platform provides an integrated approach to high-quality literature, helps find the latest and most important scientific publications in high-impact factor journals, conference proceedings, etc., as well as shows citations of scientific publications. Thematic coverage: Social sciences and humanities, exact sciences.

Scopus (published by Elsevier) is a bibliographic citation database of research literature, the database contains the citation index of scientific articles. The full texts of the articles can only be downloaded from the journals available in ViA's subscribed databases or from those which are freely available. Thematic coverage: Social sciences and humanities, exact sciences.

Lursoft (annual reports of companies) – available only in the library.

Since March 2020, remote access to some digital collections of the National Library of Latvia such as Periodika.lv, gramatas.lndb.lv has also been opened.

The library actively participates in the testing of electronic resources and full-text databases offered by the State Agency "Culture Information Systems Centre". In the academic year of 2021/2022,

there were eight such databases.

Available statistics on the use of databases in the academic year of 2021/2022:

- EBSCO database – 20506 sessions, 69423 searches,
- Science Direct – 6384 searches, 11173 full text views
- Web of Science – 1620 sessions, 7192 searches
- Scopus – 4154 searches
- LURSOFT – 761 requests

Procedure for developing library collection

The library collection corresponds to ViA study programmes and study fields. Books published in Latvia are purchased, in cooperation with Valmiera Library, in small quantities each month. The library also accepts donations from individuals and legal entities to develop library collection with missing printed materials or those having insufficient number of copies, and other documents.

Books published outside Latvia are purchased at the request of the academic staff in accordance with ViA Library book ordering and usage procedure.

If it is an open access resource available on the web or in the databases subscribed by the library, a printed copy is rarely purchased.

Table No.9. *Purchase of books for the need of the study field during the reporting period*

Year	**Information technologies**			Construction of Wooden Houses and Eco-building + **Mechatronics**		
	Titles	Copies	Amount	Titles	Copies	Amount
2014	7	16	962.52	17	21	1851.99
2015	9	11	703.08	4	4	315.81
2016	24	37	1919.51	14	29	1255.89
2017	33	51	2410.68	33	91	2959.86
2018	49	105	5380.73	8	8	1453.09
2019	19	27	914.31	26	45	2309.66
2020	43	54	3529.05	7	17	468.87
2021	7	13	724.35	18	32	1708.25
2022	4	4	513.36	4	7	298.29

Funding for ViA library collection is not divided by the study fields because during the study process the library resources are often used by students of several study fields. The most important items within each course are renewed on a cyclic basis, while the most current items of additional literature are purchased on a regular basis.

Books available to students for learning the topics are classified in the following sections, the literature is in Latvian and English:

Table No.10. *Classification of books available in the library for the needs of the Faculty of Engineering.*

		Collection of Valmiera Integrated Library	
UDK	**Description**	**Title**	**Copies**
004	Computer equipment. Internet	584	2108
005	Management. Administration	141	414
006	Standardization	62	107
303	Research methodology	123	254
330	Economics	283	1496
331.4	Working conditions. Workplace organization. Labour protection	24	68
334	Organization of economics and cooperation (includes project management)	109	354
517	Mathematical analysis. Higher mathematics	30	230
62	Technology. Engineering	570	1075
620.9	Energy economy in general	21	42
621	Mechanical engineering in general. Nuclear technology. Electrical engineering. Manufacturing devices	206	461
658	Entrepreneurship. Business organization	371	1391
658.1	Financial management	53	342
658.3	Mutual relations in the company. Staff	191	635
658.5	Organization of the production process	49	161
658.8	Marketing. Sale. Distribution	236	846
681.5	Automated control technology. Smart technology	29	54
744	Drawing. Technical drawings	16	53
811.111	English	779	2215

If the necessary books are not available in the library, a lecturer fills in a book ordering form for developing ViA Library collection and receives approval from the Director of the study field. Upon receiving the request, the library makes sure whether the book has not been pre-ordered and conducts a price survey. The book order should be placed before the beginning of the course.

The staff of the library compiles "rejected" information requests, analyzes them, and advises the lecturer a possible solution (a newer book, another book should be purchased, etc.).

Being aware of research interests of the lecturer, the library sends information about newly published books or other resources.

Database subscription procedure

Full-text databases are subscribed in cooperation with the State agency "Culture Information Systems Centre" within the programme "Electronic Publications for Latvian Libraries", as well as in cooperation with the Ministry of Education and Science within the project "Academic Network". A decision to subscribe or unsubscribe a database is made in the meeting where development, academic and scientific issues are discussed, upon agreement between the Directors of the study programmes and scientific institutes.

Collection digitization level

The library does not digitalize its collections; it collects students' diploma papers (Master's papers, Qualification papers) that are already in a digital form. It is possible to access papers through library's electronic catalogue under the section "ViA Student Papers"; access to the full text is for 760 student papers out of 2988 entries.

A database of lecturers' publications is being compiled in the library's electronic main catalogue under the section "Publications by ViA lecturers". The database contains 626 analytical descriptions of lecturers' publications (monographs, edited and compiled books, studies, conference proceedings, etc.). If these materials are available on the Internet, links to their full text are provided in the descriptions.

2.3.4. Provide a description and assessment of information and communication technology solutions used in the study process (e.g., MOODLE). If the study programmes within the study field are implemented in distance learning, the tools specially adapted for this form of study must also be indicated.

The primary platform for learning content management – for storing lecture materials, methodological instructions, various forms and information useful to the student – is Moodle. Lecturers and guest lecturers are encouraged to use it. For the convenience of students and lecturers, a single structure has been developed for reflecting the study programme content in the Moodle system. There is also a Moodle video tutorial for lecturers showing how to use it and how to load content into Moodle; if, however, someone does not understand these videos, collegial help is provided by meeting individually and showing step-by-step how to create sections and subsections.

Each study programme has its own section. In addition to the study materials, Moodle contains all the necessary information related to the study process – useful information (general information for first-year students), student travel information booklet, applications/forms, information on applying for certificates and transcripts, information about paid services, applying for studies, registration for next semesters, rotation, information about documents regulating the study process, as well as

information about the experience recognition process and international opportunities.

Moodle is also used to upload graduation papers, annual projects and internship reports.

LAIS is a study administration system in which students register for courses and keep track of their study progress; this system is administered by the Study Administration Group of ViA.

Students can promptly follow the list of lectures and changes thereto using the system lekcijas.va.lv, which is administered by ViA Operational Management Group.

Due to the Covid-19 pandemic in the spring of 2020 and the subsequent remote studies a diverse use of technology was promoted. To provide remote lectures, the following tools were used: Webex, Zoom, Google Meet, Teams.

In the academic year of 2021/2022, there was a single transition to the digital solutions offered by MS 365. Thus, MS 365 software is fully used in the study process – MS Teams is used to conduct remote lectures; it is also used as a quick communication site with students – each study programme group has its own MS Teams channel for communication with the Director of the study programme and study specialists.

MS Forms is used to submit internship applications, graduation paper topics – this process is automated – when applying for an internship, an internship agreement is automatically created and information about it is sent to both the internship supervisor and the Dean of the faculty. In the same manner the topics of the State graduation papers are also submitted.

In the reporting period, from 2018 to 2021, training series / educational seminars were organized for the lecturers involved in the study process to improve their digital skills and competences by the support of the *project "Development of Academic Staff and Human Resources of Vidzeme University of Applied Sciences" (project No. 8.2.2.0/18/A/012) of the specific support goal 8.2.2 "To strengthen the academic staff of the higher education institutions in the areas of strategic specialization" of the European Social Fund operational programme "Growth and employment"*. The range of topics included practical training in working with Microsoft Office 365 software, interactive tools Tableau R and Infogram, creating e-lectures and screen recordings with iSpring Free cam. There were also seminars on cyber security, digital ethics, and types of disinformation and ways to recognize them.

2.3.5. Provide information on the procedures for attracting and/or employing the teaching staff (including the call for vacancies, employment, election procedure, etc.), and the assessment of their transparency.

ViA has developed the Regulations "On Election to Academic Positions" (updated on 26 January 2022) which regulate the procedure by which academic staff is elected at ViA. Vacancies are advertised by announcing a competition on the official website of "Latvijas Vēstnesis", as well as by publishing information on the ViA website. The principles of openness and access to information are complied with throughout the entire recruitment process. Persons are elected for academic positions as a result of an open competition.

Scientific, pedagogical and organizational qualifications of an applicant for the position of a professor or an associate professor are assessed by the Council of Professors in accordance with the procedures specified by the Cabinet.

The scientific and pedagogical qualifications of the applicant for the position of an assistant professor, lecturer or assistant are assessed by the Council of the study field referring the matter to the relevant assembly of the faculty.

Eligibility criteria for applicants to academic positions:

1. The following person may apply for a position of an **assistant**: a holder of a Master's or Doctoral degree; if the applicant does not have a Master's degree, he or she has to have at least five years of practical work experience in the speciality according to the subject to be taught in the profile subjects of the professional study programmes, submitting documents certifying professional experience and the length of service; the applicant has to have at least one scientific publication and/or at least one presentation of a report at a conference or seminar within the last six years.
2. The following person may apply for a position of a **scientific assistant**: a holder of a Master's degree who has at least one scientific publication and/or at least one presentation of a report at an international conference or seminar within the last six years.
3. The following person may apply for a position of a **lecturer**: a holder of a Master's or Doctoral degree who has developed educational methodological developments or their projects: lecture notes, programmes, methodological instructions, demonstration materials, laboratory demonstrations, etc. – not less than three in total during the last six years; who has at least three scientific publications and at least three presentations at conferences or seminars in the last six years. If the applicant does not have a Master's degree, he or she has to have at least five years of practical work experience in the speciality according to the subject to be taught in the profile subjects of professional study programmes, submitting documents confirming professional experience and the length of service.
4. The following person may apply for a position of an **assistant professor**: a holder of a Doctoral degree who has published or developed teaching aids, methodological instructions, lecture notes, assignments, collections of laboratory demonstrations and other teaching methodical materials – in total no less than three in the last six years; for scientific publications, monographs, articles, patents and inventions, presentations at conferences with reports – a total of no less than four publications in the last six years and no less than four reports at conferences; experience of international and inter-university cooperation (implemented cooperation projects, agreements, guest lectures, internships, etc.).
5. The following person may apply for a position of a **researcher**: a holder of a Doctoral degree, who has published scientific publications relevant to the field of science announced (at least four publications in cited sources in the last six years); presentations at international conferences (at least four during the last six years).
6. The following person may apply for a position of a **leading researcher**: a holder of a Doctoral degree, who has scientific publications corresponding to the announced field of science (at least six publications in internationally cited sources and/or scientific monographs during the last six years); professional work experience in the relevant branch of science or academic work experience (in total not less than five years); international and/or national project management or work package management experience; presentations at international conferences and preparing at least one research project application in the last six years.
7. The following person may apply for the position of an **associate professor**: a holder of a Doctoral degree who has scientific publications relevant to the scientific discipline, textbooks, teaching aids, who actively carries out scientific work, and who has a total of not less than five years of scientific and academic work experience, of which at least two years of academic work in an elected position at ViA, or equivalent amount of academic work.
8. The following person may apply for the position of a **professor**: a holder of a Doctoral degree

who is internationally recognized specialist in his or her scientific discipline and who has scientific publications relevant to the scientific discipline, who actively carries out scientific research corresponding to the modern level and provides high-quality studies in the relevant subdiscipline of science, and whose length of service regarding academic and scientific work in general is no less than 10 years, of which at least three years of work experience in the position of an elected **associate professor** at ViA.

The scientific, pedagogical and organizational qualifications of the applicant to the position of a professor or associate professor are assessed by the council of professors in accordance with the procedures established by the Cabinet.

Refer to the annex for the "Regulations on Election to Academic Positions at Vidzeme University of Applied Sciences" (see Annex 16).

Refer to the annex for the ViA Remuneration Regulations (see Annex 17).

Refer to the annex for the work content and duties of ViA lecturers (see Annex 18).

2.3.6. Specify whether there are common procedures for ensuring the qualification of the academic staff members and the work quality in place and provide the respective assessment thereof. Specify the options for all teaching staff members to improve their qualifications (including the information on the involvement of the teaching staff in different activities, the incentives for their involvement, etc.). Provide the respective examples and specify the way the added value of the possibilities used for the implementation of the study process and the improvement of the study quality is evaluated.

ViA has established a common procedure for ensuring the qualification and performance quality of the academic staff.

The improvement of the qualification is laid down in the job description of the teaching staff of Vidzeme University of Applied Sciences. The needs for improving the qualification of the lecturers are discussed at the level of study fields, funding is sought accordingly within the framework of faculty and projects; besides, opportunities are offered to the lecturers to participate in Erasmus+ mobility to improve their qualification, as well as to use other financial resources for qualification improvement visits and participation in academic and professional conferences.

For the professional development of lecturers in the period from 2018 to 2021, the European Social Fund project *"Development of Academic Staff and Human Resources of Vidzeme University of Applied Sciences" (SAM 8.2.2)* was implemented within the framework of which the academic staff had the opportunity to increase their knowledge in digital technologies and academic leadership, to learn English, as well as to do internship in industry companies, promoting closer cooperation with the industry. As part of the project, 9 of the representatives of the academic staff involved as lecturers in the study field did internship in the following companies: SIA Cognitio IT, AS Valmieras Stikla Šķiedra, SIA LMT, SIA EK Sistemas, SIA Fanout, SIA Sungis, SIA Mikrokods, SIA EK Sistemas.

In order to ensure the improvement of the qualification, performance quality and professional development of ViA academic staff, lecturers within the framework of Erasmus+ and other mobility programmes have the opportunity to supplement and expand their knowledge and professionalism by gaining international experience or doing internship at higher education

institutions/organizations abroad, as well as by participating in relevant seminars and conferences.

During the reporting period, some of the lecturers of the study field have updated their knowledge in the programme jointly offered by RBS and the University of Buffalo (USA); the programme aimed at improving the quality of teaching information and communication technologies. There was even an internship within the MechaUz project for the improvement of the content of the study programme Mechatronics.

In order to ensure the assessment of the performance quality of ViA academic staff, once per academic year ViA organizes a seminar for lecturers on the study quality assurance issues in which they discuss their experience/observations gained during the lectures. The Director of the study field organizes an additional meeting if it is necessary to address quality improvement issues in more detail and/or to conduct in-depth research of problems (including document review).

Once per academic year (in October), the lecturer has to submit to the Dean of the faculty a report on his or her achievements in scientific work, experience gained in projects, seminars and conferences, if any. The information submitted is used for the preparation of scientific reports and self-assessment reports of the study fields.

2.3.7. Provide information on the number of the teaching staff members involved in the implementation of the relevant study programmes of the study field, as well as the analysis and assessment of the academic, administrative (if applicable) and research workload.

Both the elected lecturers and the professionals of the field invited as guest lecturers are involved in the implementation of the study field. This is one of the ways in which the balance between the acquisition of theoretical and practical knowledge is achieved in the content of the study programme. It is ensured that the lecturers involved in the implementation of the study field programmes know and understand the relevant subject, they have the necessary skills and experience to effectively transfer their knowledge and insight to students. The decision on the election of the teaching staff (lecturers, assistant professors) and approval of guest lecturers is made by the Assembly of the faculty after getting acquainted with the education, qualifications and competencies of each applicant. If necessary, a potential guest lecturer is invited to a discussion with representatives of the Assembly of the faculty in order to provide a more detailed insight into the professional knowledge required for the course.

The selection of the teaching staff involved in the implementation of the study field programmes is based on the following criteria:

- direction of scientific activity and research interests,
- competence and knowledge accumulated in academic work (preparation of study courses) in the fields related to the content of the study programmes, applicant’s scientific degree and qualification.

A prerequisite for involvement of academic staff in the implementation of study programmes is as follows: a Master’s degree or doctoral degree, or a status of a doctoral candidate, studies in subsequent stages of doctoral studies, as well as knowledge of English at least at B2 level taking into account that all study programmes can be implemented in both Latvian and English (in Master's level programmes - C1 level, in accordance with the conditions of implementation of the project "Establishment and Approval of New Master's Study Programmes to Promote International

Competitiveness of Vidzeme University of Applied Sciences" Nr.8.2.1.0/18/A/011). If there is no Master's degree, there has to be at least five years of practical work experience in the specialty according to the subject to be taught in the profile subjects of the professional study programmes, submitting documents confirming professional experience and the length of service.

A prerequisite for the involvement of guest lecturers in the implementation of study programmes is a Master's degree and/or an internationally recognized certificate issued by professional industry associations, which is equivalent to a Master's degree, or significant practical work experience of at least five years in the field corresponding to the study course and knowledge of foreign languages.

In the academic year of 2021/2022, 75 lecturers were involved in the implementation of the study programmes. *Some of them teach courses in several study programmes.* The largest number of lecturers involved in the study programme – 43 – was in the college programme "Information Technologies" and Bachelor's programme "Information Technologies". A relatively smaller number of lecturers is in the Mechatronics programmes – 22; while the two Master's programmes involve an average of 13-15 lecturers.

In order to optimize the workload of the teaching staff, individual study courses are taught in combined groups, for example, the study courses "Research Methodology and Scientific Publications", "Innovations and Project Management" of the Master's programmes are taught to student groups combining both Master's programmes together.

Table No.11. *Teaching staff involved in the implementation of study programmes in the academic year of 2021/2022.*

	IT (college), IT (Bachelor's)	Mechatronics (college), Mechatronics (Bachelor's)	Virtual Reality and Smart Technologies (Master's)	Cybersecurity (Master's)	Socio-technical systems modelling (Doctoral)
2021	43	22	15	13	11

Information on the methodology for the determination of workload of the academic staff is available in the ViA Remuneration Regulations.

Refer to the annex for basic information on teaching staff involved in the implementation of the study field (see Annex 19).

Refer to the annex for Curriculum Vitaes of academic staff (Curriculum Vitae in Europass format) (see Annex 20).

Refer to the annex for ViA Remuneration Regulations (see Annex 17).

2.3.8. Assessment of the support available for the students, including the support provided during the study process, as well as career and psychological support by specifying the support to be provided to specific student groups (for instance, students from abroad, part-time students, distance-learning students, students with special needs, etc.).

Career and psychological support provided by the higher education institution is available to all ViA students (full-time students, part-time students, local students and international students). Before the Covid-19 pandemic, career counselling was provided by means of face-to-face sessions. When

the remote study process began, counselling was provided online by appointment.

Individual career counselling free of charge is available to students throughout the year and can be used:

- To identify their professional goals and move towards their achievement,
- To develop their career intention and action plan after graduation,
- To make sure that the study programme chosen is the most suitable, to check their professional suitability for the chosen field,
- To receive support as they search for a job and a place of internship, to diversify their job searching strategies,
- To improve their CVs, covering letters and to help prepare for a job interview,
- To understand their goals in life, abilities, talents, etc.,
- To plan further education,
- To gain structured support for starting a business,
- To address other issues related to career development.

Potential students can also benefit from career counselling as it helps them in the following:

- To choose the right study programme,
- To take tests of their professional suitability for various fields of study and work,
- To identify their abilities, talents, values, qualities,
- To reduce tension and anxiety about choosing the right study programme and the higher education institution after leaving the school.

In the academic year of 2021/2022, 14 students registered for consultations, of which 3 were male students and 11 were female students – one of the female students was a student of the exchange programme. If before the Covid-19 pandemic counselling was mainly used for career counselling, then during the Covid pandemic the following was discussed during consultations: study motivation, Covid, homesickness.

In 2021, an informative poster “Student’s Journey” was prepared for the convenience of students. The poster depicts the processes/stages related to studies at ViA in a laconic and structured manner, with an indication of the contact persons and main activities of each specific stage. The informative posters are placed in the faculty’s premises and also included in students’ printed planners and posted on Moodle.

Support for first year students is provided by course godparents appointed by ViA Student Union – senior year students who willingly undertake and fulfil this role – to provide informative support to first year students in matters related to the study process. Furthermore, “buddies” are assigned to international students, who introduce them to the study process, are the contact persons in case of confusion, and also introduce the culture of ViA, Latvian traditions and help them settle into the student environment.

The premises used for the implementation of the study field are located at Tērbatas Street 10, and they are adjusted for students with special needs. During the reporting period, persons with special needs have studied/are studying in the programmes of the study field – the Dean of the faculty and the Director of the study programme have been informed about such persons and their assistants. The Director of the study programme is informed about the possible risks and difficulties which these persons can face in the study process; their assistants also have a phone number of the Director of the study programme for communication in case of need.

The teaching staff involved in the implementation of the study field applies an individual approach

when working with these students, for example, students with reduced mobility carry out practical assignments involving fine motor skills by the help of VR devices.

2.4. Scientific Research and Artistic Creation

2.4.1. Description and assessment of the fields of scientific research and/or artistic creation in the study field, their compliance with the aims of the higher education institution/ college and the study field, and the development level of scientific research and artistic creation (provide a separate description of the role of the doctoral study programmes, if applicable).

Research and research strategy of ViA is a response to the new challenges posed by the transition to the knowledge-based society and globalization. The long-term goal of research at ViA is to create and apply new technologies of the next generation knowledge society. The medium-term goal of research at ViA is to promote the national and regional development of smart specialization areas and increase productivity by conducting research in the directions of current social and technological challenges.

The common research direction of ViA is digital solutions for social challenges. The following sub-directions of the common research direction are implemented within the study field:

- Virtual reality technologies and visualization;
- Modelling of imitations of sociotechnical systems and security;
- E-study management and technologies;
- Smart technologies of the national economy and eco-buildings.

The research sub-direction “Virtual reality technologies and visualization” focuses on the development of new, innovative solutions and the improvement of existing solutions in a number of sectors of the national economy and society, including tourism, history, medicine, logistics, manufacturing, architecture, training, marketing, etc. The Virtual Reality Technology Laboratory of the Faculty of Engineering was established in 2009 in cooperation with the Virtual Reality Training and Development Centre of Fraunhofer Institute (Magdeburg, Germany) and the University of Agder (Kristiansand, Norway). Using the latest ICT technologies in the world, a number of solutions have been created in these areas, and the official approval of this research sub-direction is a logical step to update research activities in the field of virtual reality, the importance of which is also rapidly growing in Latvia.

The research sub-direction “E-learning management and technologies” is focused on the development of new, innovative solutions and on the improvement of existing solutions in the field of education, increasing the availability of innovative e-learning to promote the knowledge-based economy in Latvia, including tourism, history, medicine, logistics, manufacturing, architecture, training, marketing and other sectors of the national economy. The development of this research sub-direction is a proactive response to societal challenges and the goals set out in the lifelong learning policy guidelines – to ensure access to lifelong learning for the population regardless of their age, gender, previous education, place of residence, income level, ethnicity, social status, functional disorders; to develop a high quality education offer for adults which ensures sustainable competences for work, civic participation, personal development and which promotes the development of a competitive knowledge economy based on high skills and democratic society in

Latvia. Taking into account the current challenges related to the entry of digital technologies into the knowledge management ecosystem of the society, it is necessary to increase the competence of the society in accordance with the long-term action plan of Latvia which lays down the availability of education and changes in the organization of the educational process, the school as a social networking centre, contextual education and changes of the teacher's profession, the use of e-schools and information technology and lifelong learning. Within the project "Development of Vidzeme Continuing Education Technology Centre" and "Lifelong Learning Development Guidelines 2016-2020 in Vidzeme Region, and the Development of the Prototype of the Technological Solution" a concept for continuing education and the guidelines for the development of education in Vidzeme region were developed, as well as a prototype of the technological solution was created using the latest ICT technologies. Several solutions have been created and research in e-learning management and technology has been conducted to update the development of digital solutions for various social challenges, the importance of which is also rapidly growing in Latvia.

The research sub-direction "Socio-technical systems modelling technologies" is focused on interdisciplinary research which includes the assessment of engineering technology solutions in the social system and the evaluation of social science research results using simulation modelling technologies, as well as company modelling methodologies. The research sub-direction includes the generation of new knowledge not only in the context of applied research, but also in the development of simulation modelling technologies and provides input and innovations in the sub-sectors "Electrical Engineering, Electronics, Information and Communication Technologies", "Systems Analysis, Modelling and Design" while working on new solutions not only in the socio-technical systems modelling, but also in the development and assessment of the information technology ecosystem which is currently a vast field of research in the European context. The sub-field of research has been developing since 2006 when the structural unit "Institute of Sociotechnical Systems Engineering" was established in ViA. A collaborative platform for assessing the sustainability of nature and buildings through simulation and modelling technologies has been established in this research sub-direction. It has the following main research tasks:

- modelling of acceptance and sustainability of socio-technical systems;
- heterogeneous and distributed imitation modelling technologies;
- modelling the sustainability of energy efficiency of natural resources and buildings.

The need for the research sub-direction "Smart technologies of the national economy and eco-buildings" is determined by the regional demand, including the need of the specialists prepared by the study programme "Construction of Wooden Houses and Eco-building" implemented at ViA. Internationally, construction of wooden houses and energy efficiency aspects become more and more popular, and the particular research sub-direction, although currently defined as a regional sub-research direction, has a high potential for growth in future.

The topics of doctoral theses are closely related to research directions and projects implemented in these research directions. Doctoral students are involved in research projects in which new techniques for dynamic modelling, virtual reality and smart solutions are developed, as well as such projects develop a system for forecasting and modelling security and vulnerability, thereby strengthening the existing research directions and raising a new generation of researchers.

2.4.2. The relation between scientific research and/or artistic creation and the study process, including the description and assessment of the use of the outcomes in the study process.

Lecturers of the study programme “Virtual Reality and Smart Technologies” are involved in the fundamental and applied research project “Visualization of Real-Time Bog Hydrological Regime and Simulation Data in Virtual Reality”. The goal of the project is to develop technology for automated visualization of 3D spaces and real-time display of simulation model data, which would serve as a tool in the hands of decision-makers when making decisions on sustainable management of bogs as a carbon sinks.

Furthermore, within the framework of the project “Next Generation Micro Cities of Europe”, which was implemented with the support of the EU, the Bachelor’s study programme “Information Technologies” was revised and improved, as well as several innovations were introduced in the programmes of the study field.

Within the project:

- research “Implementation of Generational Marketing in Educational Institutions” was conducted on the attraction of local and international students in technical industries. By testing various marketing innovations, ViA managed to increase the number of students in the study programme “Information Technologies” by 14%.
- innovative educational solutions (EdTech) and initiatives were introduced, within the framework of which technologies become educational tools for the new generation, preparing them for the work in the future. In ViA, an active learning classroom was established and virtual reality systems for mechatronics students were installed.

Active learning classrooms are suitable for students’ needs and equipped with the necessary technologies. There are large desks and movable chairs designed to facilitate and promote active learning. Each desk is equipped with a whiteboard and a flat-screen monitor for displaying student works, and in larger classes, each desk is usually also equipped with a microphone. Active learning classrooms also include a teacher station that allows the teacher to select, project and highlight the work of any student in the classroom. These classrooms are also suitable for the distance learning process, connecting several classes at the same time. Before choosing the active learning classroom, ViA did a preliminary survey of the equipment available in the world. The main emphasis was not only on technology, but on finding a solution that would create a suitable environment for collaboration and active learning. The solution found is actually designed to promote a student-centred approach where students are in charge of their own learning process, providing a flexible approach to different learning styles, subjects and needs.

The second innovation tested by ViA within the project is an interactive, fully inclusive 3D environment which will be used for the purposes of the Bachelor’s study programme “Mechatronics”, especially in two study courses: “Organization of Production and Service Processes” and “Electric Drive”. At the current stage of development, the 3D environment provides:

- a step-by-step training mode, in which the trainee can visually follow the steps of assembly and disassembly of the electric engine;
- gradual training mode, in which the trainee follows the instructions to independently assemble and disassemble an electric engine, choosing the right parts in the right order.

Measures planned for the future include the implementation of a system for evaluating the tasks performed during assembly and disassembly and receiving feedback; increasing the complexity of the possible scenarios and improving the data collection of the performed activities to ensure the efficiency of the production process in accordance with LEAN principles.

The goal of the project “Advancing Human Performances in Cybersecurity” (Advances) is to develop

a comprehensive, science-based, interdisciplinary framework to develop and assess the general and subject-specific competencies of the current and future cybersecurity workforce. Risk assessment and educational components are tested in a student environment. The main goal is to advance the performance of the cybersecurity specialist by identifying possible improvements from three different perspectives: by considering the human as a biological entity, by analyzing behaviour patterns of the person, and by addressing the necessary knowledge and skills of the cybersecurity specialist.

The project is based on a hypothesis that it is possible to map cyber competencies required to solve cyber-crimes, defend infrastructure or be resilient to cyber abuse, and then to develop a rational competence improvement path for a cybersecurity specialist. When dealing with critical infrastructure or handling online mission-critical support systems, there are no tools that enable the assessment of human characteristics or inherent risks, or research components are not validated scientifically. The developed methodology is planned to be tested and approved within the courses of the professional Master's programme "Cybersecurity Engineering".

At the end of 2022, the international project "Twinning in Environmental Data and Dynamical Systems Modelling for Latvia" (TED4LAT) will be launched directly affecting the improvement of dynamic modelling study courses in accordance with the modern research field, as well as the doctoral programme of sociotechnical systems modelling in general and doctoral students through doctoral schools and exchange trips, thus promoting the exchange of knowledge and ideas.

2.4.3. Description and assessment of the international cooperation in the field of scientific research and/or artistic creation by specifying any joint projects, researches, etc. Specify those study programmes, which benefit from this cooperation. Specify the future plans for the development of international cooperation in the field of scientific research and/or artistic creation.

Vidzeme University of Applied Sciences is actively involved in international cooperation projects with the existing partner organizations, and also initiates international projects with new partner organizations.

- Project "reSilienT fARminG by Adaptive microclimaTe managEment - STARGATE" will develop a breakthrough, multiscale and holistic climate smart agriculture methodology, capitalizing innovations in the field of microclimate and weather risk management, as well as in the field of landscape design. The methodology is based on the integration of Earth Observation, weather/climate and the Internet of things to promote more efficient farm/plot management; opportunities to adapt to climate change; formulation of local and regional policies allowing ensuring better landscape management, protection against climatic risks; implementation of microclimate changes.
- Project partners: Greece, Czech Republic, Israel, Spain, Switzerland, Austria, Poland, Germany, Norway, Belgium.
- Estimated duration: 2019 – 2023
- Study programmes involved: 1. Doctoral programme "Sociotechnical Systems Modelling", 2. Professional Bachelor's programme "Mechatronics"

- Project "Engaged and Entrepreneurial European University as Driver for European Smart and

Sustainable regions" (EUDRES) of the Erasmus+ programme initiative "European Universities". The goal of the project is to contribute to the development of small and medium-sized European cities and their regions. The project is intended to significantly strengthen the innovation system of the regions, to contribute to the digital, environmental and sustainable transformation of the regions, thus moving towards the smart and sustainable development of the regions. It is expected that the project will result in the development of a European university model and management concept, joint study courses and programmes, mobility of lecturers and students, and research in the field of artificial intelligence.

- Project partners: Austria, Belgium, Romania, Hungary, Portugal.
- Estimated duration: 2020 – 2023
- Link with the study process: within the project, it is planned to implement various types of activities (hackathons, I-Lab), in which ViA students of the study field together with students from the participating countries will work on the development of solutions (IT/AI, well-being, circular economy) for the improvement of the region / life quality of the region. The teaching staff from the ViA study field and the project partner universities will also be involved in the activities.
- Involved study programmes: all study programmes of the study field and programmes offered by ViA.

- Project "SEMPRE Accelerators for Service Co-creation" is a continuation of the project "SEMPRE – Social Empowerment in Rural Areas". The main element of the extension phase is to accelerate the growth and development of the eight most promising micro-projects using additional support mechanisms and turn them into successful, self-developed, newly created social enterprises that consistently offer services and/or products in the local and regional markets of the Baltic Sea region. The project will also improve and strengthen the three main deliverables of the original SEMPER/1 project – the Empowerment Handbook, the Organizational Guide and the Empowerment Guide.
- Project partners: Germany, Denmark, Sweden, Lithuania, Estonia.
- Estimated duration: 2019-2021.
- Advances: increasing cyber security capabilities of society. The project will address the urgent need for a scientific understanding of human limitations and capabilities in the cyber-attack chain by studying human behaviour in cyber security, combining the fields of computer science, psychology and human genomics research. As a result of the project, a set of methodologies and tools will be created, which will include specific software components for data collection and analysis, self-report tools to collect actual data on social behaviour patterns.
- Project partners: Estonia, Lithuania, Norway, Liechtenstein.
- Estimated duration: 2021-2023.
- Involved study programmes: Doctoral programme "Sociotechnical Systems Modelling".

- Project "Twinning in Environmental Data and Dynamical Systems Modelling for Latvia" (TED4LAT). The goals of the project: to encourage institutional changes and transformations in management processes in the field of research and innovation at the national level in Latvia in accordance with the principles of the common European research space, to mobilize investments and increase the capacity in research and innovation in primary target countries, to increase the participation rate of Latvian institutions in other Horizon Europe programmes, to promote emergence of a new ecosystem through cooperation with similar institutions and

adopting the good experience and practice in research excellence from cooperation partners, implement a detailed programme for the exchange of staff experience, short-term and long-term visits, seminars, doctoral school, thus promoting the exchange of knowledge and ideas, to develop a strategic research programme for a multidisciplinary approach in data science and modelling of dynamic systems.
- Project partners: France, Italy.
- Estimated duration: 2022-2025.
- Involved study programmes: Doctoral programme “Sociotechnical systems modelling”.

- ERASMUS+ project INNOLABS – “Student innovation labs – a way to sustainable and socially responsible growth”. The goal of the project is to increase innovation processes in Latvia, Estonia and Cyprus, taking over the experience of partners from the Netherlands and Denmark. Within the framework of the project, experience in the establishment and management of innovation laboratories was obtained from universities in the Netherlands and Denmark; multidisciplinary and cross-industry innovation laboratories were established, promoting cooperation between higher education institutions and public and private sector partners; students are involved in 4-5 real innovation projects.
- Project partners: Latvia, Denmark, Netherlands, Estonia, Cyprus
- Estimated duration: 2014-2016
- Involved study programmes: all programmes offered by the study field and ViA

- The goal of Erasmus+ Knowledge Alliance 'Terratech'+G97 project is to develop an advanced interactive Master’s course related to Agricultural IoT Engineering. As part of the study programme, individuals will be trained in the necessary skills and knowledge to work in the growing “Smart Agriculture” industry. As part of the project, ViA provides training on the application of Virtual Reality solutions in the agricultural sector.
- Project partners: Greece, Hungary, Portugal, Italy
- Estimated duration: 2020-2023
- Involved study programme: Virtual Reality and Smart Technologies
- General goals of the Erasmus+ project “Extended Reality in Biomedical Environments (REEB)” are to bring biomedical companies and health training centres closer together using mixed reality, augmented reality and virtual reality, and to improve the knowledge acquisition of our students in healthcare training.
- Project partners: Los Gladiolos (Spain), Kauna University (Lithuania), Geovance, La Laguna University (Spain, Tenerife), Bioaraba (Spain)
- Estimated duration: 2021-2023
- Involved study programme: Virtual Reality and Smart Technologies

- 2022-2023 Participation in the European Defence Industrial Development Programme project “Tactical Combat Casualty Care and Battlefield Advanced Trauma Life Support” (EDIDP-SME-2020-045-VireTS).

- 2015-2016 MID Mobilities for Innovation and Development, University of Turku, Finland. Research topic “Visualization and virtualization of simulation modelling data for various economic domains”. Grant agreement 2012-2742/001-001-EMA2 939/25/2012.

2.4.4. Specify the way how the higher education institution/ college promotes the involvement of the teaching staff in scientific research and/or artistic creation. Provide the description and assessment of the activities carried out by the academic staff in the field of scientific research and/or artistic creation relevant to the study field by providing examples.

As part of the study field, research is carried out at the Socio-Technical Systems Engineering Institute (SSII). The following lecturers of the study field are also elected to its scientific council: professor and leading researcher Sarma Cakula, associate professor and leading researcher Arnis Cīrulis, associate professor and leading researcher Kaspars Osis, lecturer and researcher Alvis Sokolovs. The lecturers involved in the study field are participating in one of the research directions mentioned above.

Postdoctoral students of the study field who are also lecturers of the study field, are also involved in the scientific activity of SSII. Postdoctoral projects are a good opportunity to involve lecturers in scientific research.

- Dynamic 3D visualization of the Internet of Things elements in outdoor augmented reality modes.
- The goal of research: to develop a solution for the visualising of the Internet of Things elements in outdoor and indoor environments, where distances to the object exceed five meters. The primary result of this research is to provide a dynamic and animated three-dimensional (3D) computer model depiction in augmented reality mode without the use of fiducial or image-based markers. Project manager: ViA assoc.prof. Arnis Cīrulis. Duration: 01.09.2017 - 31.08.202
- Research on complex whole-body rehabilitation for lowerer extremity amputees by means of extended reality and advanced wearables data processing.
- The goal of the project is to develop an augmented reality solution that would implement a new rehabilitation method, innovative wearable technologies and algorithms based on medical know-how by the help of which the quality of life of CAEAs would be increased, the rehabilitation process would be accelerated and reintegration into society and work would be improved.
- Project manager: Dr.sc.ing. Linda Lancere.
- Duration: 02.01.2019. - 30.12.2021
- Research of Computer Vision Algorithms for Underwater Fish Inspection.
- The main goal of research is to design new automated methods for understanding the environment using underwater images, which would enable the sustainable use and management of living aquatic resources, thereby maximizing the social and economic benefits of the European seas and oceans.
- Project manager: Dr.sc.comp. Mohcine Boudhane.
- Duration: 15.03.2019. - 14.03.2022
- Artificial Intelligence (AI) Support for Accelerated Math Acquisition Approach (AI4Math)
- The goal of the project is to develop an interdisciplinary mathematics support strategy using Artificial Intelligence (AI), Big Data and stimulating learning approaches, thus promoting the 5^{th} area (ICT) and the 5^{th} growth priority of the Smart Specialization Strategy (VSS) for promoting the development of a modern education system that meets the requirements of the future labour market and contributes to the transformation of the national economy.
- Project manager: Dr.math. Aija Cunska.
- Duration: 01.04.2020 - 31.03.2023

Within the framework of the SSII, funding has also been attracted within the framework of several scientific grant projects financed by the municipality of Valmiera allowing attracting lecturers for research. Some of these projects, together with successful international cooperation, have provided a good basis for the Horizon 2020 project.

- 2013-2014 – project “Visualization of Virtual Buildings in Real Space for Urban Planning (City 3D-AR)”,
- 2014-2015 – project “Designing an Interactive Three-Dimensional Environment for Learning Anatomy from Computed Tomography Images”,
- 2014 – project “Design of a Simulation Model and Software Prototype for Assessing the Use and Sustainability of Natural Resources in Households in the Area of Protected Landscapes”,
- 2015-2016 – project “Development of Guidelines for Lifelong Education 2016-2020 in Vidzeme region and Design of a Technological Solution Prototype”,
- 2016 – project “Design of a Prototype of Simulation Model and Platform-compatible Software for Long-Term Analysis and Monitoring of Energy Resource Consumption by Municipal Facilities”,
- 2016-2017 – project “Prototype of Online Augmented Reality System for 3D Animated Models”,
- 2018 – “Analysis of Socio-Technical Opportunities Provided by 5G Technologies and Drafting Proposal for Development of Smart Urban Environment Model and Research Projects”.

As for the academic environment of ViA, doctoral studies are a logical and natural way of ensuring involvement in scientific research. During the previous accreditation period, two lecturers have obtained a doctoral degree in the areas represented in the IT programme content and relevant to the study courses taught. Also, the new doctors, in the beginning of the reporting period of the study field, have been actively working on their scientific research projects and some of them have already been elected to positions of associate professors. Also, new doctors, professors and researchers have been involved in the study field during the reporting period.

Within the study field, leading researchers and professors actively work on attracting new doctoral students and encouraging existing lecturers to obtain a doctoral degree. At present, six lecturers of the study field are studying in ViA Doctoral programme “Sociotechnical Systems Modelling” and/or are writing their doctoral theses in the field of electrical engineering, electronics, information and communication technology.

Over the past years, SSII's science-based funding is gradually increasing, which is an additional opportunity to pay for the scientific activity of lecturers. Funds are allocated from the basic budget of ViA to pay for publications, if the preparation of publications is not already financed within the framework of a project. Lecturers of the Faculty of Engineering are informed on a regular basis on active research projects and their possibility to get involved in project implementation.

Refer to the annex for the summary of the scientific publications (see Annex 21).

2.4.5. Specify how the involvement of the students in scientific research and/ or applied research and/or artistic creation activities is promoted. Provide the assessment and description of the involvement of the students of all-level study programmes in the relevant study field in scientific research and/ or applied research and/or artistic creation activities by giving examples of the opportunities offered to and used by the students.

As far as possible, **undergraduate** students are involved in scientific or applied research, namely, in the development of various systems in accordance with the field of their study programme. One of the opportunities offered to students to get involved in applied research is, for example, the Student Practice Laboratory (S-LAB), Innovation Laboratory (I-LAB), and Business Trial Laboratory (B-LAB).

The S-LAB or Student Practice Laboratory offers an opportunity for students to do internship or to gain practical experience while working in one of the ViA's laboratories and developing products and services for various institutions and organizations, thus promoting cooperation between Vidzeme University of Applied Sciences and entrepreneurs. The purpose of the S-LAB is to develop students' practical skills and at the same time to gain experience operating both in an environment of a higher education institution and a company. In 2014, 1 student of the IT study programme worked within the framework of the S-LAB, in 2015 – 4 students of the IT study programme, in 2016 – 7 students of the IT study programme, and in 2017 – 3 students of the IT study programme. Students worked on various types of website or mobile app projects within the framework of the S-LAB.

The B-LAB or Business Trial Laboratory is a platform for supporting and assessing business ideas before starting a business. The goal of the B-LAB is to promote an interest in entrepreneurship and the development of one's own business ideas, providing the necessary advisory support, thus promoting innovation and business development in the region. In 2015, the following students of the study field participated in the B-LAB: 5 students from the programme "Information Technologies", as well as the following students participated in the seminars organized by the B-LAB: 6 students from the programme "Information Technologies", 1 student from the college programme "Information Technologies" and 7 students from the college programme "Mechatronics".

The I-LAB or Innovation Laboratory is a platform providing possibilites for student-entrepreneur-organization cooperation for solving challenges, applying a creative and innovative approach. The I-LAB provides for an opportunity to work on real and innovative products/services for the needs of a specific company. The goal of the I-LAB is to create interdisciplinary solutions for social and industrial problems of various complexity in Vidzeme region. In 2018, the following students of the study field participated in the I-LAB: 5 students from the programme "Information Technologies", 1 student from the programme "Mechatronics", and 1 student from the college programme "Mechatronics". And in 2019, the following students of the study field participated in the I-LAB: 4 students from the programme "Information Technologies".

Also, within the limits of possibilities and in accordance with the students' field of study, students are attracted to scientific research in the development of various systems. For example, a student of the professional Bachelor's programme "Mechatronics" was involved in the project "reSilienT fARminG by Adaptive microclimaTe managEment - STARGATE". He wrote his Bachelor's paper "Development of Soil Moisture Sensor Module for Various Solutions" as part of the project.

In cooperation with Aija Cunska's post-doctoral project "Artificial Intelligence (AI) Support for Accelerated Math Acquisition Approach (AI4Math)", the following Bachelor's papers were written – "Design of a Mobile Application Prototype for Learning Mathematics with the Support of Artificial Intelligence" and "Artificial Emotional Intelligence for Improving Mathematical Competence" (written by a students of the professional Bachelor's study programme "Information Technologies"), "Development of a Touch-Sensitive Pad Prototype for Learning Mathematics" (written by a student of the professional Bachelor's programme "Mechatronics").

A student of the professional Bachelor's programme "Information Technologies", was involved in the scientific grant project "Design of a Simulation Model and Software Prototype for Assessing the Use and Sustainability of Natural Resources in Households in the Area of Protected Landscapes" funded by the municipality of Valmiera, who, within the framework of the project, wrote his Bachelor's paper "Design of Software Prototype for Assessing the Use and Sustainability of Natural Resources in Households in the Area of Protected Landscapes". The student was also involved in writing the following publication – Majore G., Zakis V., Zake M., Ginters E., Zakis K., Fjodorovs A. Holistic Benchmarking of the Bioeconomy in Protected Landscape Areas. Procedia Computer Science. ICTE in Regional Development, December 2014, pp. 118-126. [indexed in Scopus]

Likewise, students of the Master's programme are also involved in scientific projects for the development of solutions or simulation models, and they are also more consciously encouraged to prepare publications. Under the leadership of Prof. Maira Lešcevica and in cooperation with ECOSOC_LV VPP project 5.2.2 "Development of Innovation and Entrepreneurship in Latvia according to the Smart Specialization Strategy" Jānis Jirgensons, a student of the Master's programme "Sociotechnical Systems Modelling", wrote his Master's paper "Imitation Model for the Involvement of Latvian Diaspora in Business", and was also involved in the development of a publication – Lescevica, M., Zamuele, A., Zake, M., & Jirgensons, J. (2019). Minimizing migration: Modelling of Latvian diaspora's involvement in cooperation with education and science, and governmental institutions, businesses and society. Procedia Computer Science, 149, 483–490.

Furthermore, a student of the Master's programme "Sociotechnical Systems Modelling", was involved in the scientific grant project "Design of a Prototype of Simulation Model and Platform-Compatible Software for Long-Term Analysis and Monitoring of Energy Resource Consumption by Municipal Facilities" funded by the municipality of Valmiera, during which he wrote his Master's paper "Long-Term Analysis of Resource Consumption of the Water Supply System of the Municipality of Valmiera". He also participated in the preparation of the publication – Majore, G., Fjodorovs, A., Zake, M., Majors, I., Kepka, M., Integration of Web Map Application and Simulation Modelling Tools for Sustainability Analysis in Regional Development, Procedia Computer Science, ICTE 2016, Latvia, 2017, Volume 104, pp. 213-221.

Below are some more examples of the involvement of students of the Master's programme in the development of scientific publications. A publication by a student of the Master's programme "Cybersecurity Engineering" –

Uljans A., Blumbergs B. Industrial and Automation Control System Cyber Range Prototype for Offensive Capability Development, Proceedings of the 8th International Conference on Information Systems Security and Privacy - ICISSP, 478-490, 2022

The following students of the Master's programme "Sociotechnical Systems Modelling" were involved in the preparation of publications:

Juris Binde, M.Fuksa, Mobile Technologies and Services Development Impact on Mobile Internet Usage in Latvia. 12th International Scientific Conference "Management Horizons in Changing Economic Environment: Visions and Challenges", Kaunas. (Lithuania), 26-28.09.2013. Management of Organizations: Systematic Research, Volume 67. KaunasVytautas Magnus University; Kaunas, Lithuania, 2013, p.23-37.

Nīlanders K., Cakula S. Modelling potential foreign applicant flow: Case of Vidzeme University of Applied Sciences. IEEE engineering education towards Openness and Sustainability. 2014, pp. 210-215, ISBN 978-1-4799-3190-3, IEEE Xplore: 978-1-4799-3191-0

Ginters, E., Cirulis, A., Blums, G. Markerless Outdoor AR-RFID Solution for Logistics. In: Procedia in Computer Science. Eds. Jorge Martin-Gutierrez, Egils Ginters. 2013 International Conference on

Virtual and Augmented Reality in Education. Elsevier. ISSN 1877-0509. Vol.25. 2013. 80-90.

Ginters, E., Aizstrauts, A., Baltruks, M., Nazemi, K., Burkhardt, D., Sonntagbauer, P., Sonntagbaur, S., Gutierrez, J.-M. (2014). FUPOL Simulators and advanced visualization framework integration. In Proceedings of 26th European Modelling & Simulation Symposium (EMSS 2014). ISBN 978-88-97999-38-6 (paperback), ISBN 978-88-97999-32-4, 10-12 September, Bordeaux, France, 523-530.

Ginters, E., Aizstrauts, A., Dreija, G., Ablazevica, M., Stepucev, S., Sakne, I., Baltruks, M., Piera Eroles, M.-A., Buil, R., Gusev, M., Velkoski, G. (2014). Skopje Bicycle Inter-modality Simulator – e-involvement through simulation and ticketing. In Proceedings of 26th Europen Modelling & Simulation Symposium (EMSS 2014). ISBN 978-88-97999-38-6 (paperback), ISBN 978-88-97999-32-4, 10-12 September, Bordeaux, France, 557-563.

Aizstrauts, A., Ginters, E., Baltruks, M., Gusev, M. (2014). Architecture for Distributed Simulation Environment. ICTE in Regional Development, December 2014, Valmiera, Latvia. Ginters, E., Schumann, M. (eds.). Procedia Computer Science, Elsevier, ISSN: 1877-0509, Volume 43, 18-26. doi:10.1016/S1877-0509(15)00231-8

Aizstrauta, D., Ginters, E., Baltruks, Piera Eroles, M.-A. (2014). Applying theory of diffusion of innovations to evaluate technology acceptance and sustainability. ICTE in Regional Development, December 2014, Valmiera, Latvia. Ginters, E., Schumann, M. (eds.). Procedia Computer Science, Elsevier, ISSN: 1877-0509, Volume 43, 69-78. doi:10.1016/S1877-0509(15)00231-8

As for **doctoral students**, involvement in scientific research is a very important aspect in order to write an adequate doctoral thesis. One of the tasks of all doctoral students during their doctoral studies is preparation of publications, therefore publications written by doctoral students will not be listed separately. Also, doctoral students are involved in research projects of the institute within the limits of possibilities and according to their research fields. For the involvement of three graduates of the study programme in scientific research projects, refer to section 3.18.6. The involvement of doctoral students in research projects is consciously and purposefully directed by their supervisors, heads of the research sub-field and other researchers of the institute. Some of the projects in which doctoral students have been, are or will be involved:

- 2019-2023 – reSilienT fARminG by Adaptive microclimaTe managEment – STARGATE
- 2021-2023 – Advances: Increasing the Cyber Security Capabilities of Society
- 2014 – Scientific grant project funded by the municipality of Valmiera “Design of a Simulation Model and Software Prototype for Assessing the Use and Sustainability of Natural Resources in Households in the Area of Protected Landscapes”
- 2016 – Scientific grant project financed by the municipality of Valmiera “Design of a Prototype of Simulation Model and Platform-Compatible Software for Long-Term Analysis and Monitoring of Energy Resource Consumption by Municipal Facilities”
- 2022-2025 – The project “Twinning in Environmental Data and Dynamical Systems Modelling for Latvia” (TED4LAT)
- 2018-2018 – scientific grant project funded by Valmiera city municipality “Analysis of Socio-Technical Opportunities Provided by 5G Technologies and Drafting Proposal for Development of Smart Urban Environment Model and Research Projects” – Mārtiņš Janševskis
- Project “Visualization of Real-Time Bog Hydrological Regime and Simulation Data in Virtual Reality (BogSim-VR)”, LZP (No. lzp-2020/2-0396).
- 2022-2023 – Participation in the European Defence Industrial Development Programme project “Tactical Combat Casualty Care and Battlefield Advanced Trauma Life Support” (EDIDP-SME-2020-045-VireTS).

2.4.6. Provide a brief description and assessment of the forms of innovation (for instance, product, process, marketing, and organisational innovation) generally used in the higher education institution, especially in study field subject to the assessment, by giving the respective examples and assessing their impact on the study process.

Within the framework of the project "*Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Regions*" of Erasmus+ initiative "European Universities", innovative study methods are integrated into the study process, thus promoting entrepreneurship and creativity in students, helping them learn prototyping skills and encouraging them to create their own startup companies, at the same time creating innovative ideas for the smart and sustainable transformation of regions not only in Latvia, but also on a European scale.

During the implementation of the project, from 2021 to the moment of submitting the report, ViA students (of various study fields, levels) have participated in *hackathons, Bootcamps and Living Laboratories* by participating in international student teams, learning interdisciplinary and future skills demanded by the labour market. Starting from the academic year of 2022/2023, Living Laboratories are included in the study programmes of the study field as a mandatory part of individual courses.

The annual, international VR/AR technology hackathon has become a tradition within the Master's programme "Virtual Reality and Smart Technologies", which gathers industry representatives, students and VR enthusiasts in order to find solutions to specific industry challenges in an intensive three-day programme.

Within the framework of the project NextGen (Next Generation Micro Cities of Europe), a generational marketing strategy and action plan were developed and implemented. By testing various marketing innovations, Vidzeme University of Applied Sciences increased the number of students in the programme "Information Technologies" by 14% in 2020. One of the generational marketing innovations tested by Vidzeme University of Applied Sciences is the involvement of students and lecturers in the creation of high-quality content and experimentation with various audio-visual formats, using the multimedia laboratory studio with a green screen, a glass board available at ViA and other solutions. The content generated by the students has been noticed by pupils who were most impressed by student interviews with company representatives, experience stories, interviews and conversations with IT students.

As part of the NextGen project, Vidzeme University of Applied Sciences has also developed a Bachelor's programme in IT education in English, and has introduced modern EdTech solutions based on the Active Learning Classroom (ALC) approaches within the framework of several study courses. The ALC is an approach that provides students with the opportunity to engage in activities that are simultaneously linked to course objectives. The ALC covers both facilities and various pedagogical strategies and methods to engage students in more active participation and deeper understanding of the course topic. In 2020, ViA has built two classrooms adapted to the needs of the ALC study process, investing more than EUR 140,000 in relevant infrastructure and various technological and software solutions.

As part of the project, an ALC working group was established, whose activity was focused on informing lecturers on the ALC, involving them in various trainings, as well as developing ViA ALC manuals. In order to support lecturers in the integration of the ALC approach in courses they are teaching, 2 manuals were written – "Steps for Integrating the Active Learning Class (ALC) of Vidzeme University of Applied Sciences into the Study Course" and "Common Approach for the

Integration of ViA I-LAB and the Previous ALC-PBL Type Courses in the Study Process" – in an electronic format freely available to every ViA lecturer. By gradually collecting and analyzing experience gained within the project on the integration of the ALC in the teaching-learning process, the content of the manuals was supplemented and improved in response to various challenges (for example, the remote learning process during the restrictions of COVID-19).

Within the framework of the academic year of 2020/2021, the approbation of the ALC approach at ViA took place through 6 pilot courses within the IT programme:

- Algorithms and data structures
- Work environment and civil defence
- Computer architecture
- Introduction to Python programming and data exploration
- Professional communication in engineering
- Cross-cultural communication

In total, 150 students have been trained using the ALC approach within the project, 7 lecturers have learned/tested the work with ALC methods within 6 courses.

The goal of Vidzeme Innovation Programm for Students (VIPs) is to create and implement a sustainable support system that, within the framework of the study or education process, strengthens the innovation literacy and entrepreneurial skills of Vidzeme youth, promotes the cooperation of Vidzeme University of Applied Sciences and students with industry and entrepreneurs, and enables the development of practical solutions for the challenges pointed out by society and merchants.

During the VIPs project, it is planned to introduce a complex and versatile mechanism helping promote and strengthen mutual cooperation between students, the industry and the municipality, providing the opportunity to engage in two different activities (Innovation Laboratory and Business Laboratory), which provide for both teamwork and individual cooperation with a company in developing practical solutions or investigating a problem situation. "Vidzeme innovation programme for students" promotes an open environment, wider availability of resources, and support for creativity, bold ideas and innovative solutions.

The main activities of the VIPs project: Student involvement and motivation, inspiring forums and career counselling; Summarizing entrepreneurs' challenges, establishment and maintenance of the Idea Bank and attraction of private funding; Building and enabling teams, hackathons and workshops; Formulation of ideas and projects, formation of teams; Innovation Laboratory (I-LAB), Business Laboratory (B-LAB); Demo days; Final forum, TV show.

Students of the STEAM field, as well as experts, are especially encouraged to participate in the VIPs programme to ensure the integration of ICT knowledge in the creation of solutions, thus ensuring a modern and advanced ICT system at various levels. The programme allows raising the opportunities of students and academic staff to a new level, ensuring the development of the necessary competencies, entrepreneurial skills and creativity. Students participating in the programme gain additional knowledge and will be potentially more valuable future employees and/or employers.

Pedagogical innovations are one of the transversal themes of the European Social Fund's project "Development of Academic Staff and Human Resources of Vidzeme University of Applied Sciences" (SAM 8.2.2.), during the implementation of which, from 2018 - 2021, lecturers visited colleagues' classes, discussed the things observed, as well as talked over professional development opportunities. Within the framework of this project, a new form of cooperation with industry companies was also tested – internship of lecturers at merchant companies, which contributed to the formation of closer cooperation with the industry.

2.5. Cooperation and Internationalisation

2.5.1. Provide the assessment as to how the cooperation with different institutions from Latvia (higher education institutions/ colleges, employers, employers' organisations, municipalities, non-governmental organisations, scientific institutes, etc.) within the study field contributes to the achievement of the aims and learning outcomes of the study field. Specify the criteria by which the cooperation partners for the study field and the relevant study programmes are selected and how the cooperation is organised by describing the cooperation with employers. In addition, specify the mechanism for the attraction of the cooperation partners.

Cooperation on a Latvian scale is implemented both with educational institutions (higher education institutions, vocational education institutions, schools), as well as with public and municipal institutions, industry companies and industry associations.

Upon choosing cooperation partners from the academic environment for the study field and within the framework of study programmes, both the study programme offered by the specific partner university/educational institution and the cooperation potential are assessed. In most cases, the choice of partner universities is also determined by the lecturers' previously established cooperation with the lecturers of the specific partner university within the framework of projects/scientific research. Before making a decision on entering into a new cooperation agreement within the framework of the study field, each new cooperation agreement is discussed in advance at the faculty meetings, with the participation of the Dean of the faculty and Directors of the study programmes, and assessing the necessity of entering into the agreement.

The main criteria in the selection of partners are as follows: professional experience, reliability of the partner, potential for cooperation possibilities within a specific programme or for strengthening research. In the selection of cooperation partners, the focus is on the quality rather than quantity.

Within the framework of cooperation with educational institutions (vocational education institutions, higher education institutions), scientific projects are implemented, knowledge transfer is promoted, and joint projects are carried out, with the goal to strengthen the specific study programme and provide those studying in it with even more opportunities for cooperation and scientific research.

Upon choosing cooperation partners from the environment of industry companies, it is assessed whether, within the framework of this cooperation, it is possible to offer internship for students, to attract company employees to give specific guest lectures and/or teach study courses, which would provide students with the much-needed current knowledge of the industry, as well as to cooperate in the phase of graduation papers – by offering current topics of graduation papers, and also by inviting company representatives to participate in the evaluation process of study papers.

Furthermore, cooperation with municipal and regional institutions provides added value in the context of the development of the region and promotes the involvement of students in solving issues relevant to the region, as well as in raising the overall competitiveness of the region. Within the framework of the study field, further education opportunities are offered to those working in municipal institutions, as well as a dialogue is built with municipal institutions in solving issues relevant to them – both within the framework of international projects, and also by offering specific topics for students' graduation papers, as a result of which a certain digital solution would be

developed for the region. Responsiveness of municipal authorities is also essential in providing internships, which in the long term would help prevent the outflow of labour force from the region and possibly promote the creation of new jobs.

Very important cooperation in the context of the region is being developed with LIAA Valmiera Business Incubator, local government of Valmiera municipality, Valmiera Development Agency, and Vidzeme Planning Region. Cooperation with the above institutions is carried out both individually with each of them and in joint meetings, ensuring the representation of the study field's interests in the strategic planning carried out by the Planning Region and municipality, examination of development issues, providing opinions at higher political institutions, e.g., ministries, and preparation of strategic documents. Besides, close cooperation ensures a quick circulation of information about the necessary competences for regional and municipal companies and business incubator clients. Such cooperation helps involve students in innovation programmes and also promote the development of innovations within the study field.

Cooperation with several professional organizations is implemented within the framework of the programmes of the study field. Cooperation with the Latvian IT cluster within the framework of the Demola programme, cooperation with the Association of Security Professionals has been started. Vidzeme University of Applied Sciences is a member of the Latvian Information and Communication Technology Association (LIKTA) and the Latvian Electrical Engineering and Electronics Industry Association (LETERA); informative/content-related support in the implementation of the study field programmes has been provided by the Information Technology Security Incident Response Institution CERT.LV and the National Guard of the Republic of Latvia.

Refer to the annex for the summary of the cooperation agreements (see Annex 22).

2.5.2. Provide the assessment as to how the cooperation with different institutions from abroad (higher education institutions/ colleges, employers, employers' organisations, municipalities, non-governmental organisations, scientific institutes, etc.) within the study field contributes to the achievement of the aims and learning outcomes of the study field. Specify the criteria by which the cooperation partners suitable for the study field and the relevant study programmes are selected and how the cooperation is organised by describing the cooperation with employers. In addition, specify the mechanism for the attraction of the cooperation partners.

One of the most important strategic cooperation networks, which ViA joined in the academic year of 2020/2021, is implemented within the Erasmus+ initiative "European Universities" – EUDRES. **Nine higher education institutions from nine European countries (FH St. Poelten/Austria, UCLL University of Applied Sciences/ Belgium, Hungarian University of Agriculture and Life Sciences/Hungary, Saxion University of Applied Sciences/Netherlands, Politecnic Institute of Setubal/Portugal, Polytechnic University of Timisoara/Romania, Fulda University of Applied Sciences/Germany, Jyvaskyla University of Applied Sciences/Finland) combine their resources in the fields of learning, research and innovation to find solutions to the future challenges of the region. The Alliance follows the idea "From Europe to Europe".**

Within the framework of EUDRES, the European University model, management concept and joint study courses and programmes are being developed; mobility of students and lecturers and

joint research are carried out in the following areas: human well-being (including the aging of society), **people and artificial intelligence**, circular economy.

Since 2021, students of the study field have been involved in the international projects organized by the consortium such as hackathons, Bootcamps, Living Labs, where, under the guidance of experienced international lecturers, they worked on the development of solutions/concepts/prototypes for a specific industry/industry need. As an example, we can mention the application prototype developed for the Romanian Capital of Culture Timisoara 2022, as well as the development of a chatbot prototype for the needs of Vidzeme Tourism Association. In this way, while working in international student teams, students gain insight during the development process through summarizing user needs, conducting market research, using prototyping tools, and also acquire communication and socialization skills, intercultural differences, time management – these qualities will be useful when working for industry companies, as well as it will also prepare them for work in an international environment.

Within the framework of the consortium, international guest lecturers have been attracted to the programmes of the study field, and closer cooperation is also planned in scientific research and/or supervision of graduation papers.

Along with the already named strategic cooperation network, ViA continues to operate within the framework of Erasmus+, developing cooperation with the programme's countries and partner countries.

ViA has entered into 130 cooperation agreements with partner universities from 48 countries. A list of cooperation agreements with foreign partner universities can be found on the ViA website https://va.lv/sites/default/files/ViA%20Sadarb%C4%ABbas%20Augstskolas_15032022.pdf

The goal of cooperation agreements is to strengthen bilateral cooperation between the higher education institutions in both the academic and scientific fields, as well as to promote the mobility of students and staff. Erasmus+ cooperation agreements are entered into for the period of time from 2014 to 2022; the validity period of other cooperation agreements varies from 3 to 5 years.

Upon choosing cooperation partners from the academic environment for the study field and within the framework of study programmes, both the study programme offered by the specific partner university and the cooperation potential are assessed. In most cases, the choice of partner universities is also determined by the lecturers' previously established cooperation with the lecturers of the specific partner university within the framework of projects/scientific research.

2.5.3. Specify the system or mechanisms, which are used to attract the students and the teaching staff from abroad. Provide the assessment of the incoming and outgoing mobility of the teaching staff in the reporting period, the mobility dynamics, and the issues which the higher education institution/ college faces with regard to the mobility of the teaching staff.

The existing networks of cooperation partners are used in attracting international students – information about the programmes for exchange students offered by ViA is sent to cooperation partner universities, while participation in exhibitions abroad promotes the attraction of new partners.

Strategic partnerships play an important role in the promotion of international activities, for

example, by participating in the EUDRES consortium, ViA has been able to attract both international lecturers from the consortium's partner universities, and has also more intensively attracted international students and involved existing students in the activities organized by the consortium, including short-term exchange programmes – the implementation of the first short-term exchange programme was started in 2022 (mobilities planned for 2020 were suspended due to the pandemic caused by Covid-19) and at the time of preparation of the report, 5 students from the programmes of the study field have already participated in outgoing mobilities. In the autumn semester of 2022, as part of the consortium's mobility programme, a visit of 18 international students from the consortium's partner universities to ViA is planned.

Upon assessing statistics of incoming/outgoing mobilities of the reporting period, incoming mobilities clearly dominate. During the reporting period, a total of 117 exchange students came to ViA, of which 102 students studied at VIA within the framework of the cooperation initiated by the Bachelor's programme "Information Technologies" with the university of professional education – ESME Sudria (France). Within the framework of this cooperation agreement, students from France study for one semester at Vidzeme University of Applied Sciences in the Bachelor's programme "Information Technology", thereby gaining international experience and improving their professional skills.

The total statistics of incoming students by study fields are not summarized because international students take courses from the unified offer "International Study Module", which summarizes all courses available in English in the particular semester.

Furthermore, the number of outgoing mobilities during the reporting period is three times less than the number of incoming mobilities – this can be explained by the fact that those studying in the programmes of the study field already start working during their studies or are already employed in the industry; therefore, they choose to keep their jobs and not go on exchange studies.

The aforementioned is also confirmed by the types of outgoing mobilities – 76% of outgoing mobilities are related to internship in foreign companies and only 20% – are related to exchange studies in foreign partner universities. In terms of countries, the most visited countries are Germany, Austria, Estonia – 41% of students went to outgoing mobility to those countries.

Almost all of those involved in mobilities are students from the undergraduate programmes; among those studying in Master's programmes, only one international student has chosen exchange studies.

The International Week organized by the International Department of ViA is one of the ways to attract new cooperation partners and popularize study programmes – in the academic year of 2021/2022, 36 participants from foreign universities participated in the International Week. Foreign colleagues were introduced to ViA's research directions, study programmes offered, admission requirements and the study process in general.

The imbalance in the proportion of incoming and outgoing mobilities can also be observed within the mobilities of teaching staff. During the reporting period, ViA implemented 249 incoming teaching and/or experience exchange visits, and only 39 outgoing study field lecturer mobilities. Such an imbalance of outgoing mobilities could be explained by the workload of lecturers in the implementation of the study process and scientific research.

Due to the growing influence of social media on the daily lives of young people, ViA's social media accounts, as well as online events for attracting international students are the main information channels for informing potential international students. Through them, the Directors of the study programmes presented their study programmes to those present, as well as invited current international students to share their experiences of studying at ViA. These events were recorded

and are available on social media accounts maintained by ViA.

The website of ViA is available in Latvian and English, respectively, information about admission requirements and study programmes is available in English for international students. Information about the study programmes taught at ViA in English has also been sent to all Erasmus+ partner universities.

Refer to the annex for the information on the mobility of students and academic staff (see Annex 23).

2.6. Implementation of the Recommendations Received During the Previous Assessment Procedures

2.6.1. Assessment of the fulfilment of the plan regarding the implementation of the recommendations provided by the experts during the previous accreditation of the study field, as well as the assessment of the impact of the given recommendations on the study quality or the improvement of the study process within the study field and the relevant study programmes.

After the accreditation process of the study field in 2012, the expert group had seven recommendations. One of the recommendations was to describe and specify learning outcomes at all levels of the development and analysis of the study programme, especially – assessment criteria should be added to learning outcomes. In the academic year of 2018/2019, new course descriptions were developed in accordance with the new form, including there also learning outcomes (knowledge, skills and competences) and assessment criteria for these learning outcomes.

The expert group also drew attention to the need to discuss the study programme content with regional employers on the regular basis, besides it recommended to regularly conduct a survey of employers, and to collect and analyze data on changes in the labour market. In order to promote more effective and regular involvement of employers in the development of study programmes, advisory councils of study programmes were established, within the framework of which the persons in charge of the study programme meet with representatives of the industry. In order to discuss the current situation in the industry, possible changes and how it might affect the study programmes, meetings with the advisory councils are held on a regular basis once or twice a year. Moreover, the project NextGen (Next Generation Micro Cities of Europe) was a good basis for starting this cooperation in the study programme “Information Technologies”, within the framework of which the content of the Bachelor’s programme “Information Technologies” was renewed, taking into account the opinion of industry representatives. Currently, a regular exchange of information with employers, including regional ones, has been implemented throughout the study field.

The participation of undergraduate students in scientific research was also promoted. Courses on conducting scientific research are included in the study programmes. And within the framework of the projects and within the limits of the possibilities, researchers also involve undergraduate students in the projects. For example, the involvement of Andris Fjodorovs (at that time, a 4th year student of the Bachelor’s programme “Information Technologies”) in research within the framework of the scientific grant project funded by Valmiera city government “Design of a Simulation Model and Software Prototype for Assessing the Use and Sustainability of Natural Resources in Households

in the Area of Protected Landscapes" from 1 April 2014 to 30 November 2014. For more information on the involvement of students in scientific and applied research and creativity, refer to section No. 2.4.5.

The recommendation to expand the spectrum of operating systems and network equipment used in practical classes was taken into account, and technical support in the computer network laboratory was enhanced, and thus students have the opportunity to learn a wider spectrum of operating systems and network equipment. During the operational period, the Laboratory of Data Transmission Networks has been improved under the European Regional Development Fund (ERDF) project "Development of a unified, modern study complex suitable for persons with functional disabilities for priority study fields at Vidzeme University of Applied Sciences" and within the framework of the project "Modernization of the STEM study environment of Vidzeme University of Applied Sciences" of the specific support objective (SAM) 8.1.1 "To increase the number of modernized STEM study programmes, including medicine and creative industries" of the operational programme "Growth and Employment". Through project funding, equipment for the computer network laboratory has been purchased and devices have been supplemented meeting the requirements and applications of the leading modern IT infrastructure. Great importance is given to Mikrotik equipment to expand the spectrum of operating systems and network equipment in the laboratory. In the future, we will see to it to ensure the compliance of equipment with the leading trends in the industry.

During the previous study field accreditation, it was recommended to make a qualification improvement plan and a competence development plan for the staff. During the reporting period, special attention was paid to the professional development of the academic staff. Within the framework of the NextGen project, a lot of attention was paid to active learning methods, and lecturers were also trained in the use of these methods.

From 6 November 2018 to 30 November 2021, Vidzeme University of Applied Sciences implemented the project "Development of Academic Staff and Human Resources of Vidzeme University of Applied Sciences" of specific support goal 8.2.2 "To strengthen academic staff of higher education institutions in the areas of strategic specialization" of the Operational Programme "Growth and Employment" of the European Social Fund. Within the project, academic leadership was promoted, English language and digital skills of lecturers were improved, and academic staff gained valuable experience while doing internships at companies. Also, the faculty has introduced the practice of holding a 2-day personnel development seminar once a year.

The Quality Assurance Policy of Education of Vidzeme University of Applied Sciences was approved at the meeting of Senate of Vidzeme University of Applied Sciences on 31 January 2020, which also includes the policy of quality assurance and assessment of the academic staff's performance. Also, guidelines for observation of classes have been developed. According to ViA Quality Assurance Policy of Education, every lecturer must observe a class (a lecture, a seminar, a practical class, etc.) taught by a colleague at least once per academic year, and at least one class of the lecturer must be observed by another colleague. Both face-to-face class and distance learning class can be observed. Also, ViA Lecturer Handbook has been introduced, which describes professional development opportunities and various other issues, such as remuneration principles, types and methods of study work, preparation of a study course and its description, structure of the study courses and the specifics of remote work, consultations and communication with students, assessment, supervision of student research papers, principles and guidelines of communication, legal and ethical aspects, resources available to lecturers and other general issues of lecturer's work.

In the previous accreditation of the study field, recommendations were given regarding the

professional Master's programme "Sociotechnical Systems Modelling", however, due to the decision of the Assembly of Faculty in 2018, the study programme was closed and two new Master's study programmes were developed and licensed during the reporting period – "Cybersecurity Engineering" and "Virtual Reality and Smart Technologies".

Regarding the Doctoral programme:

- The content of the study programme should include more courses on general (fundamental) models used in computer science and engineering, emphasizing that there are not enough computer science courses in the programme at present, although the doctoral degree awarded is Comp.Sc. or Sc.Eng.

- The goal of the study programme should be defined in such a way that it reflects the knowledge that will be acquired in the programme

- To develop a clear study methodology

- To expand doctoral studies

In the academic year of 2018/2019, more general models were included in the course "Engineering of Sociotechnical Systems Requirements". And starting from the academic year of 2019/2020 the proportion of computer science courses in the programme was increased. We will continue working on increasing the range of studies.

During the reporting period, ViA's second doctoral programme "Economics and Business" was established in the Faculty of Social Sciences, which provides more opportunities for doctoral studies at ViA.

Based on the recommendations of the previous accreditation, improvements have been made in the study process by ensuring regular updates of course descriptions, regular meetings with both students and industry representatives. The involvement of students in research has also been promoted. New and improved equipment has been acquired. The content of the doctoral programme has been improved together with the partner university RTA. Several study processes have been revised and streamlined, which improves the students' study experience and reduces the administrative burden.

Refer to the annex for the information on the implementation of the recommendations made in the previous accreditation (see Annex 24).

2.6.2. Implementation of the recommendations given by the experts during the evaluation of the changes to the study programmes in the respective study field or licensed study programmes over the reporting period or recommendations received during the procedure for the inclusion of the study programme on the accreditation form of the study field (if applicable).

The recommendations given by the licensing expert commission regarding the programme "Cybersecurity Engineering" *(license No. 04031-25, 13.06.2018)* were mainly focused on improvements in the content of the study course descriptions, increase of the number of CPs for

individual courses, and inaccuracies in study course translations. The course “Applied Cryptography” is included in Part A, while “Python for Security Testers” is included in Part B. Course descriptions have been revised, translation inaccuracies have been corrected, and literature sources have been updated.

The recommendations given by the licensing expert commission regarding the programme “Virtual Reality and Smart Technologies” *(license No. 04031-23, 30.05.2018)* focused on the need to ensure the study process in English even in the situation where there are no international students, as well as on the in-depth involvement of graduates in research. At the same time, there was a recommendation to balance the workload of lecturers and promote the development of scientific publications in the field of VR. The study process in the current time period since the academic year of 2020/2021 is provided only in English. During the study process, students as far as possible are involved in research and creative activities in the field of VR/AR, including, they – through the higher education institution – actively participate in the “Innovation Voucher Support Services” programme implemented by the Latvian Innovation and Development Agency.

During the licensing process of the Mechatronics study program *(license No. 04031-22, 25.09.2017)* , one of the experts' recommendations was that the program should be more relevant to the study direction of mechanics and metalworking, thermal energy, thermal engineering and mechanical engineering. But the professional qualification of Mechatronics engineer is issued upon graduation from the study program. Since Mechatronics combines such fields of engineering as mechanics, electronics and computer science, the study program corresponds to the study direction "Information technologies, computer engineering, electronics, telecommunications, computer control and computer science". Also, the concept of Industry 4.0 includes both IT and Mechatronics, and smart sensors and digitization are included in both names.

In the licensing process of the Mechatronics program, recommendations related to the descriptions of the study courses and their too generality also have been given. During the implementation of the study program, improvements have also been made to the course description forms. The distribution of contact hours and individual working hours are now more clearly indicated in the course descriptions. Also, the goals and tasks of production and pre-diploma internship have been clarified. A study program advisory board has been established and greater involvement of employers in the development of the study program is carried out. Since the licensing of the study program, new teaching staff have also been attracted to the study program, increasing the proportion of teaching staff who have a doctoral degree and scientific publications in the field of Mechatronics.

Annexes

I - Information on the Higher Education Institution/ College		
Information on the implementation of the study field in the branches of the higher education institution/ college (if applicable)		
List of the governing regulatory enactments and regulations of the higher education institution/ college	4P-ViA-normativie-akti_Normatives-2022FEB-red27042022.docx	4P-ViA-normativie-akti_Normatives-2022FEB-red27042022.docx
The management structure of the higher education institution/ college	3P_ViA_structure.pdf	3P-ViA_struktura_paplasinata_pec_18032020.pdf
II - Description of the Study Field - 2.1. Management of the Study Field		
Plan for the development of the study field (if applicable)	6P-IT-development-plan.docx	6P-IT-virziena-attistibas-plans.docx
The management structure of the study field	1A-SV-parvaldibas-struktura_SF-managament-structure.docx	1A-SV-parvaldibas-struktura_SF-managament-structure.docx
A document certifying that the higher education institution or college will provide students with opportunities to continue their education in another study programme or another higher education institution/ college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.	FINAL_ligumi_agreements.zip	FINAL_ligumi_agreements.zip
A document certifying that the higher education institution or college guarantees compensation for losses to students if the study programme is not accredited or the study programme license is revoked due to actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.	0P-Studiju-ligums-t.sk.-2.8.p.-KOMPENSACIJA_Study-agreement-also-2.8.p.-COMPENSATION.docx	0P-Studiju-ligums-t.sk.-2.8.p.-KOMPENSACIJA_Study-agreement-also-2.8.p.-COMPENSATION.docx
Standard sample of study agreement	0P-Studiju-ligums-t.sk.-2.8.p.-KOMPENSACIJA_Study-agreement-also-2.8.p.-COMPENSATION.docx	0P-Studiju-ligums-t.sk.-2.8.p.-KOMPENSACIJA_Study-agreement-also-2.8.p.-COMPENSATION.docx
II - Description of the Study Field - 2.2. Efficiency of the Internal Quality Assurance System		
Analysis of the results of surveys of students, graduates and employers	14P_Studējošo_darba dev viedoklis_LV_red.zip	14P_Studējošo_darba dev viedoklis_LV_red.zip
II - Description of the Study Field - 2.3. Resources and Provision of the Study Field		
Basic information on the teaching staff involved in the implementation of the study field	19P-Docetāju saraksts-List of lecturers-red.xlsx	19P-Docetāju saraksts-List of lecturers-red.xlsx
Biographies of the teaching staff members (Curriculum Vitae in Europass format)	20P-Docetaju_CV-Acad.Person._CV.zip	20P-Docetaju_CV-Acad.Person._CV.zip
A statement signed by the rector, director, head of the study programme or field that the knowledge of the state language of the teaching staff involved in the implementation of the study programmes within the study field complies with the regulations on the state language knowledge and state language proficiency test for professional and official duties.	Apliecinajums-IF-valsts-valoda.edoc	Apliecinajums-IF-valsts-valoda.edoc
A statement of the higher education institution/ college on the respective foreign language skills of the teaching staff involved in the implementation of the study programme at least at B2 level according to the European Language Proficiency Assessment levels (level distribution is available on the website www.europass.lv, if the study programme or part thereof is implemented)	Apliecinajums-IF-anglu-valoda.edoc	Apliecinajums-IF-anglu-valoda.edoc
II - Description of the Study Field - 2.4. Scientific Research and Artistic Creation		
Summary of quantitative data on scientific and/ or applied research and / or artistic creation activities corresponding to the study field in the reporting period.	21P_ Publikācijas_Publications.xls	21P_ Publikācijas_Publications.xls
List of the publications, patents, and artistic creations of the teaching staff over the reporting period.	21P_ Publikācijas_Publications.xls	21P_ Publikācijas_Publications.xls
II - Description of the Study Field - 2.5. Cooperation and Internationalisation		
List of cooperation agreements, including the agreements for providing internship	22P_Sadarbības līgumu saraksts_LV_ENG_List of cooperation agreements.xls	22P_Sadarbības līgumu saraksts_LV_ENG_List of cooperation agreements.xls
Statistical data on the teaching staff and the students from abroad	23P_Mobilitate_Mobility.xls	23P_Mobilitate_Mobility.xls
Statistical data on the incoming and outgoing mobility of students (by specifying the study programmes)	23P_Mobilitate_Mobility.xls	23P_Mobilitate_Mobility.xls
Statistical data on the incoming and outgoing mobility of the teaching staff	23P_Mobilitate_Mobility.xls	23P_Mobilitate_Mobility.xls
II - Description of the Study Field - 2.6. Implementation of the Recommendations Received During the Previous Assessment Procedures		
Report on the implementation of the recommendations received both in the previous accreditation and in the licensing and/ or change assessment procedures and/ or the procedures for the inclusion of the study programme on the accreditation form of the study field.	24P-SP rekomendāciju izpildes pārskati_RECOMMENDATIONS.zip	24P-SP rekomendāciju izpildes pārskati_RECOMMENDATIONS.zip
An application for the evaluation of the study field signed with a secure electronic signature	00-AIC-iesniegums-IT-VIRZIENS-eparaksts-ENG-corr.edoc	00-AIC-iesniegums-IT-VIRZIENS-eparaksts-red.edoc
III - Description of the Study Programme - 3.1. Indicators Describing the Study Programme		
Sample of the diploma and its supplement to be issued for completing the study programme		
For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions (if applicable)		
Compliance of the joint study programme with the provisions of the Law on Higher Education Institutions (table) (if applicable)		
Statistics on the students in the reporting period		
III - Description of the Study Programme - 3.2. The Content of Studies and Implementation Thereof		
Compliance with the study programme with the State Education Standard		
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard or the requirements for professional qualification (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme		
The curriculum of the study programme (for each type and form of the implementation of the study programme)		
Descriptions of the study courses/ modules		
Description of the organisation of the internship of the students (if applicable)		
III - Description of the Study Programme - 3.4. Teaching Staff		
Confirmation that the academic staff of the doctoral study programme includes not less than five doctors, of which at least three are experts approved by the Latvian Council of Science in the branch or sub-branch of science in which the study programme intends to award a scientific degree (if applicable)		

Confirmation that the academic staff of the academic study programme complies with the requirements specified in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions (if applicable)		

Other annexes

Name of document	Document
2P-Studentu-statistika-2013-2022-AIKA-visi-StudentStatistics.xlsx	2P-Studentu-statistika-2013-2022-AIKA-visi-StudentStatistics.xlsx
4P-ViA-normativie-akti_Normatives-2022FEB-red31102022.zip	4P-ViA-normativie-akti_Normatives-2022FEB-red31102022.zip
5P-ViA_Studiju-kvalitates-nodrosinasanas-politika-APST-31012020-LV.pdf	5P-ViA_Studiju-kvalitates-nodrosinasanas-politika-APST-31012020-LV.pdf
5P-ViA_Study-quality-assurance-policy-APPR-31012020-ENG.pdf	5P-ViA_Study-quality-assurance-policy-APPR-31012020-ENG.pdf
12P-ViA_Studiju_nolikums_APST-ar-ped- groz-27012021.pdf	12P-ViA_Studiju_nolikums_APST-ar-ped- groz-27012021.pdf
12P-ViA_Study-regulations_APST-ar-ped- groz-27012021-ENG.pdf	12P-ViA_Study-regulations_APST-ar-ped- groz-27012021-ENG.pdf
13P-ViA_Etikas nolikums_26042017.pdf	13P-ViA_Etikas nolikums_26042017.pdf
13P-Ētikas pārkāpumu izskatīšanas procedūra_shēma.pdf	13P-Ētikas pārkāpumu izskatīšanas procedūra_shēma.pdf
13P-Regulations-of-ethics-26042017-ENG.pdf	13P-Regulations-of-ethics-26042017-ENG.pdf
13P-Ethical Infringement Procedure Scheme.pdf	13P-Ethical Infringement Procedure Scheme.pdf
9P-Uznemsanas_noteikumi_1L_BD_MG_2022-2023_APST_27102021-ar-ped-groz-22062022.pdf	9P-Uznemsanas_noteikumi_1L_BD_MG_2022-2023_APST_27102021-ar-ped-groz-22062022.pdf
9P-Admission Regulations-2022_2023.docx	9P-Admission Regulations-2022_2023.docx
10P-DRSSM_Uznemsanas_noteikumi_2022-2023_APST_27102021.pdf	10P-DRSSM_Uznemsanas_noteikumi_2022-2023_APST_27102021.pdf
10P-DRSSM_Uznemsanas_noteikumi_2022-2023_APST_27102021 en-GB.docx	10P-DRSSM_Uznemsanas_noteikumi_2022-2023_APST_27102021 en-GB.docx
13P-ViA_Etikas nolikums_26042017.pdf	13P-ViA_Etikas nolikums_26042017.pdf
13P-Ētikas pārkāpumu izskatīšanas procedūra_shēma.pdf	13P-Ētikas pārkāpumu izskatīšanas procedūra_shēma.pdf
13P-Regulations-of-ethics-26042017-ENG.pdf	13P-Regulations-of-ethics-26042017-ENG.pdf
13P-Ethical Infringement Procedure Scheme.pdf	13P-Ethical Infringement Procedure Scheme.pdf
15P-Finansejums-izmaksas.xlsx	15P-Finansejums-izmaksas.xlsx
16P-Nolikums-par-velesanam-akad-amatos-APST-ViA-26012022-ENG.doc	16P-Nolikums-par-velesanam-akad-amatos-APST-ViA-26012022-ENG.doc
16P-Nolikums-par-velesanam-akad-amatos-APST-ViA-26012022.doc	16P-Nolikums-par-velesanam-akad-amatos-APST-ViA-26012022.doc
17P-Darba_samaksas_nolikums_20210224-latvian-only.zip	17P-Darba_samaksas_nolikums_20210224-latvian-only.zip
18P-ViA Docetaju darba saturs un pienākumi 28.05.2014.doc	18P-ViA Docetaju darba saturs un pienākumi 28.05.2014.doc
18P-ViA Content and Duties of Lecturer’s Work 28.05.2014.doc	18P-ViA Content and Duties of Lecturer’s Work 28.05.2014.doc
7P-IF_nolikums_28102015.doc	7P-IF_nolikums_28102015.doc
7P-IF_nolikums_28102015-ENG.doc	7P-IF_nolikums_28102015-ENG.doc
8P-IF_Domes_nolikums_31082018.docx	8P-IF_Domes_nolikums_31082018.docx
8P-IF_Domes_nolikums_31082018_ENG.docx	8P-IF_Domes_nolikums_31082018_ENG.docx
11P-Studiju-rezultatu-atzisanas-nolikums-APST-28082019.pdf	11P-Studiju-rezultatu-atzisanas-nolikums-APST-28082019.pdf
11P-Study-results-recognition-regulations-APPROVED-28082019.pdf	11P-Study-results-recognition-regulations-APPROVED-28082019.pdf
1P-ViA-SP-akreditacijas-dati-red2022NOV.xls	1P-ViA-SP-akreditacijas-dati-red2022NOV.xls
1P-ViA-study-programms-red2022NOV.xls	1P-ViA-study-programms-red2022NOV.xls
Nodomu_ligumi.zip	Nodomu_ligumi.zip
sadarbības līgums ar RTU, MA "Kiberdrošības inženierija" (cooperation agreement with RTU, MA "Cyber-security engineering")	01000-4.1-e_12_20230227131634.edoc
līgums par kopīgas doktora studiju programmas ''Sociotehnisku sistēmu inženierija'' pārtraukšanas alternatīvu, (RTU)/agreement on an alternative to the termination of the joint doctoral study program "Sociotechnical Systems Engineering", (RTU)	01000-4.1-e_8_20230308142534.edoc

Mechatronics (42523)

Study field	*Information Technology, Computer Hardware, Electronics, Telecommunications, Computer Management, and Computer Science*
ProcedureStudyProgram.Name	*Mechatronics*
Education classification code	*42523*
Type of the study programme	*Professional bachelor study programme*
Name of the study programme director	*Mairita*
Surname of the study programme director	*Zaķe*
E-mail of the study programme director	*mairita.zake@va.lv*
Title of the study programme director	*Mg.sc.comp.*
Phone of the study programme director	*29387950*
Goal of the study programme	*To train highly qualified specialists - mechatronics engineers for professional activities in various sectors of the economy, whose practical and theoretical knowledge, skills and abilities meet the requirements of the modern labour market.*
Tasks of the study programme	*- To provide students with practice-oriented higher professional education in the fields represented by the field of study;* *- To ensure a study process that meets the requirements of the legislation, the labour market and a student-centred approach to higher education;* *- To develop students' scientific research skills, to create motivation for further education and to encourage students' further self-education;* *- Ensure the development of diverse personal skills;* *- To create an adaptable training offer for companies and their employees in the field of study specialisations.*

Results of the study programme	*1.Develop a technological layout of production, assess the level of production automation, select appropriate materials and elements, develop an algorithm for the automation process and prepare a technical task for the design of equipment, work with special design and mechatronics equipment control computer programs, select alignment dimensions and tolerances during the design process;* *2. to compile computer programs for programming control elements of automated systems;* *3. prepare an economic justification for the equipment to be designed or manufactured and evaluate the most economically advantageous technical drawings;* *4. organise and manage the work of personnel, ensure compliance with environmental and occupational safety legislation, communicate in the national language and at least two foreign languages, know and understand the legislation on safety of equipment, be familiar with the International Standards Organisation (iso) quality safety and environmental protection systems;* *5. Perform a visual assessment of mechatronics equipment performance, develop a monitoring and visualisation system for mechatronics equipment, know how to service, diagnose and repair automated equipment;* *6. be familiar with the stages of development of design documentation, understand the interaction between mechanical, electromechanical, electronic and computer equipment, use the regulatory acts, technical documentation and standards of the mechatronics sector necessary for the performance of work, prepare technical documents, analyse, evaluate and use scientific and applied research, use information search and selection tools, implement new technologies and computer programmes,* *7. To carry out professional analysis of the work assignment, processing of information and coordination of the work assignment with the technological possibilities of production, to be able to predict the failure-free operation of mechanical, electromechanical, electronic and computer equipment, to use the capabilities of mechanical, electromechanical, electronic and computer equipment in a targeted manner and to organise their maintenance;* *8. be able to select the components required for the automation process (hydraulic and pneumatic system components, electrical and optical components, etc.);* *9. design the layout of all automated or equipment to be installed and organise the distribution of work among workers, using computer-aided design and computer-aided manufacturing (cad/cam) technologies for project development;* *10. Rational organisation of interrelated work processes, preparation of automation project materials for presentation.*
Final examination upon the completion of the study programme	*Bachelor's Thesis*

Study programme forms

Full time studies - 4 years - latvian

Study type and form	*Full time studies*
Duration in full years	*4*
Duration in month	*0*
Language	*latvian*
Amount (CP)	*160*
Admission requirements (in English)	*Secondary education*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Professional bachelor's degree in mechatronics*
Qualification to be obtained (in english)	*Mechatronics Engineer*

Places of implementation

Place name	City	Address
Vidzeme University of Applied Sciences	VALMIERA	CĒSU IELA 4, VALMIERA, VALMIERAS NOVADS, LV-4201

Full time studies - 4 years - english

Study type and form	*Full time studies*
Duration in full years	*4*
Duration in month	*0*
Language	*english*
Amount (CP)	*160*
Admission requirements (in English)	*Secondary education; Level of English language proficiency at least at B2 level*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Professional bachelor's degree in mechatronics*
Qualification to be obtained (in english)	*Mechatronics Engineer*

Places of implementation

Place name	City	Address
Vidzeme University of Applied Sciences	VALMIERA	CĒSU IELA 4, VALMIERA, VALMIERAS NOVADS, LV-4201

3.1. Indicators Describing the Study Programme

3.1.1. Description and analysis of changes in the parameters of the study programme made since the issuance of the previous accreditation form of the study field or issuance of the study programme license, if the study programme is not included on the accreditation form of the study field, including changes planned within the evaluation procedure of the study field evaluation procedure.

Since the accreditation letter was issued, the scope and sequence of individual study courses have been changed, ensuring continuity of content and more successful learning in later courses. For example, the study programme Electrical Drives 2KP has been divided into two courses - Fundamentals of Electrical Machines 2KP and Electrical Drives 4KP, which ensures a more complete learning of the course content, with more emphasis on practical classes. The study process places greater emphasis on strengthening students' practical skills, providing a sufficient theoretical basis for understanding technical issues and solving problems. Using the infrastructure and other facilities provided by cooperation partners, students are given access to materials and equipment that they will encounter in companies to solve practical tasks. Increased use of the study content management system to record student attendance and grades. Communication with students is carried out on the MS Teams platform.

Below are the changes made to the study programme since it was licensed in 2017.

Courses have been removed from the study programme:

Russian Language (2KP)

PLK Application and Programming (4KP)

Metalworking (2KP)

Mechatronics Equipment Supervision, Maintenance, Repair (2KP)

Industrial Automated Process Visualisation II (4KP)

Part orientation, assembly technology and equipment (2KP)

New courses added to the study programme:

Foreign Language (German, French) (2KP)

Intercultural Awareness (2KP)

Physics II (2KP)

Introduction to the specialty (2KP)

Fundamentals of Electrical Machines (4KP)

Courses have changed credit amounts:

Computer Applications in Engineering Mechanics from 4KP to 2KP

Electrical Drives from 2KP to 4KP

Electrical Power Automation from 2KP to 4KP

PLC Programming I from 2KP to 4KP

PLC Programming II from 2KP to 4KP

Course moved from the general education part to the vocational specialisation part:

Fundamentals of Computer Systems Administration (2KP)

Course moved from the theoretical core part of the sector to the professional specialisation part of the sector:

Electrical Documentation (2KP)

During the reporting period, to optimise the resources of the field of study, a decision was taken to close the College programme in Mechatronics and to redirect resources to strengthen the other study programmes of the field of study.

3.1.2. Analysis and assessment of the study programme compliance with the study field. Analysis of the interrelation between the code of the study programme, the degree, professional qualification/professional qualification requirements or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements. Description of the duration and scope of the implementation of the study programme (including different options of the study programme implementation) and evaluation of its usefulness.

Vidzeme University of Applied Sciences offers a professional Bachelor's programme "Mechatronics" (the qualification to be awarded – Mechatronics Engineer). Educational content of the programme helps acquire knowledge and skills that are necessary for specialists in the specific fields of the labour market. The programme includes a set of knowledge, skills and abilities required in the modern labour market – understanding of mechatronics systems, preparing mechatronic tasks and acquiring methods for their solution, designing of mechatronic systems, choosing elements, designing and developing schemes and implementing mechatronic systems technologies in industry and other sectors of the national economy, including programming skills, understanding of the Internet of Things and robotic systems, knowledge of foreign languages, teamwork skills, etc. The Bachelor's programme emphasizes the understanding of industrial automated processes, which students learn while working on individual projects, research projects and diploma papers, during practical classes and internships.

Graduates of the study programme are awarded the professional qualification of Mechatronics Engineer. As Mechatronics combines engineering fields such as mechanics, electronics and computer sciences, the study programme corresponds to the study field "Information Technology, Computer Engineering, Electronics, Telecommunications, Computer Control and Computer Science", as well as to the corresponding study programme code (42523). Industry 4.0 also includes IT, Mechatronics, Smart Sensors and Digitalisation, so these terms can be considered as common to

the field of study.

The main tasks of a mechatronics engineer are to develop, modernise and implement mechatronic systems in production, to monitor, diagnose, maintain and repair them, to organise, plan and manage technical processes in production and the personnel under his/her supervision, to advise on innovations in the mechatronics sector and on the possibilities of implementing them in production. The main duties and tasks of a mechatronics engineer are the design, development and modernisation of mechatronic systems, the operation of mechatronic systems, the diagnosis, maintenance and repair of mechatronic systems, the management of technical processes in the enterprise, and other general tasks for the provision of professional activities. The study programme, its content and study outcomes are closely related to the professional qualification of Mechatronics Engineer and provide the necessary knowledge, skills and competences.

Upon applying to the programme, results of the centralized examinations (CE), as well as the average grade in mathematics/algebra/geometry, informatics/applied informatics and in one subject of the natural sciences are taken into account. Understanding of the subjects of exact sciences is necessary to be able to successfully participate in the study process and learn the course material. Taking into account the upcoming changes in the Cabinet of Ministers Regulation No 846 "Regulations on Requirements, Criteria and Procedures for Admission to Study Programmes", starting from the academic year 2023/2024, the basic criterion for admission requirements will be all CEs passed by the student, with the possibility to obtain additional points for passing a higher level CE in physics or mathematics.

The purpose of the first-level professional study programme “Mechatronics” is to prepare qualified specialists – mechatronics technicians for professional activity in various industries, whose theoretical and practical knowledge, as well as skills, abilities and attitudes meet the requirements of the modern labour market, and who are able to undertake and perform the duties defined in the Occupational Standard: to develop, modernize and introduce mechatronics systems into production, to ensure their monitoring, diagnostics, maintenance and repair, to organize, plan and manage technical processes in production, to lead personnel under his or her command, to provide advice on novelties of the mechatronics industry and possibilities of their implementation in production. Acquisition of applied knowledge through course projects, research projects and diploma paper, practical classes, laboratory demonstrations and internships is emphasized in the study process.

The programme offers a practically oriented education that meets requirements of the modern labour market and prepares qualified specialists. After graduating from the programme, students are entitled to continue their studies in the professional Bachelor’s programme “Mechatronics”. Duration of studies in the first-level professional programme corresponds to the content of the programme and is sufficient for students to complete both internships provided for in the programme.

The purpose of the professional Bachelor’s programme “Mechatronics” is to prepare highly qualified specialists – mechatronics engineers for professional activity in various sectors of the national economy, whose practical and theoretical knowledge, skills and abilities meet requirements of the modern labour market. Industry companies indicate that ViA students and graduates are sought-after specialists on the labour market.

Duration of the study programme is appropriate and sufficient for acquiring educational content provided for in the study programme.

The duration and scope of the study programme shall comply with the minimum number of credits specified in the Cabinet Regulations. The labour market demand is sufficiently high, which is why it

is necessary to prepare specialists in the shortest possible time. The mapping of the study courses against the study outcomes of the study programme indicates that the study courses provide the necessary knowledge to achieve the objectives and outcomes of the programme.

The quality of the Bachelor's programme "Mechatronics" is also confirmed by the employment rate of students and success of the companies set up by the students themselves.

Refer to the annex for the Sample of the diploma and its supplement to be issued for mastering the study program (see Annex 26).

3.1.3. Economic and/ or social substantiation of the study programme, analysis of graduates' employment.

With the growing demand for automation and digitization in industry and agriculture, the need for highly skilled mechatronics specialists has rapidly grown over the past decade. At the time of preparing the self-assessment report, 10 vacancies are available in the fields of technical science, production and industry on the largest Latvian vacancy portal – www.cv.lv.

Likewise, the study on the Latvian labour market forecasts for 2040 prepared by the Ministry of Economics indicates that with the increasing use of technology in everyday life, automation, robotization and digitization processes, the demand for highly qualified workforce which is trained in exact sciences and information technologies, including in the field of mechatronics, will increase. In accordance with research forecasts, it is estimated that by 2027 the shortage of specialists in STEM fields may reach as many as 14,000.

Furthermore, estimates of the World Economic Forum show that in 2025 one of the most demanded professions will be data science, the ability to work with artificial intelligence systems and cloud computing services.

Manufacturing companies located in Valmiera, for example AS "Valmieras stikla šķiedra" (Germany) (glass fibres and glass fibre products), Valmiera – Andren Ltd. (Latvian-Swedish joint venture) (tanks, pipes and other equipment for storing aggressive liquids), Culimeta Baltics SIA (threads and textures, fibreglass products), Food Union / AS "Valmieras Piens" (milk processing, production of dairy products), cooperative society of agricultural services "VAKS" (pre-processing, sale, storage of agricultural products), Valtanks SIA (Sweden) (underground reservoirs, tanks, technological shafts, etc.), SIA "VALPRO" (metal fuel cans, fire extinguishers and fire extinguisher housings, and other metal products) , SIA "Daiļrade koks" / SIA "Valmieras mēbeles" (production of furniture and furniture fittings), SIA "V.L.T." (egg trays and boxes), SIA AGA (gas, gas mixtures), SIA "BALTMA" (CNC metalworking), SIA "4 Pluss" (woodworking), and other companies develop and implement new technological processes based on the application of mechatronics, which allow the manufactured products to compete in the world market. About 80-90% of the manufactured products are exported to various countries of the world.

Most of the students of the programme are involved in the labour market already during their studies, both within the framework of internships and individually, so the employment rate among graduates of the programme "Mechatronics" is 100% and most of them work in the private sector.

3.1.4. Statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down into different study forms, types, and languages.

During the reporting period, 40 students were admitted to the Bachelor's programme "Mechatronics" for studies in latvian *(studies in English were not implemented during the reporting period).* The dynamics of the number of students admitted is shown below in the table.

Table No.12. The number of students in the programme during the implementation of the programme from 2018 to 2022.

	Admitted to the programme	Number of students in the programme (as of 1.10)	Graduated from the programme
2018	12	18	-
2019	10	31	-
2020	4	28	-
2021	6	31	-
2022	8	22	13
Total	**40**	**130**	**13**

During the reporting period, the study programme is dominated by male students – 97% of those studying in the programme; while the proportion of female students in the programme is 3%.

94% of students had State budget funded study places, while 6% of students paid tuition fee.

Most of the students, or 92%, come from the Vidzeme region – Valmiera municipality, Cēsis municipality, Limbaži municipality, Sigulda municipality, Smiltene municipality, Valka municipality, Ādaži municipality, Saulkrasti municipality, Gulbene municipality, Madona municipality, Ogre municipality. The remaining 8% of students are divided between Latgale (5%) and Riga (3%). The large proportion of students from the Vidzeme region can be explained by the fact that the lecture schedule is convenient for working students.

The average dropout rate during the reporting period was 0.9% of the total number of students. Analyzing the dropout rate during the reporting period, the largest dropout is usually in the first study semester, or 40%, the remaining part of 60% is evenly spread over all semesters. The dropout rate can be explained by the students' employment and the high requirements of the study courses. Also, some students realize that they have chosen the wrong study programme or they have had difficulties with learning STEM subjects. The highest dropout rate was observed in 2019 reaching 1.8% of the total number of students. This could be due to the security measures introduced in the country to limit the spread of the COVID-19 pandemic and remote learning –

many students were unable to follow the study content, many lost motivation due to the lack of laboratory demonstrations and practical classes.

Although Vidzeme University of Applied Sciences was one of the leaders in the higher education institution segment in terms of vaccination against Covid-19, some students were not allowed to continue their studies due to the national vaccination policy that required a Covid-19 certificate to attend face-to-face lectures.

Refer to the annex for student number dynamics during the assessment period (see Annex 2).

3.1.5. Substantiation of the development of the joint study programme and description and evaluation of the choice of partner universities, including information on the development and implementation of the joint study programme (if applicable).

3.2. The Content of Studies and Implementation Thereof

3.2.1. Analysis of the content of the study programme. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators with the aims of the study course/ module and the aims and intended outcomes of the study programme. Assessment of the relevance of the content of the study courses/ modules and compliance with the needs of the relevant industry, labour market and with the trends in science on how and whether the content of the study courses/ modules is updated in line with the development trends of the relevant industry, labour market, and science.

ViA study programmes “Mechatronics” have been developed in close cooperation with specialists of leading industry companies and the Association of Mechanical Engineering and Metalworking (MASOC), as well as in cooperation with other higher education institutions where similar study programmes are implemented, for example, Rēzekne Academy of Technologies, Riga Technical University, Ventspils University of Applied Sciences, Liepāja University; every year the content of the study courses is updated in accordance with the development trends of the industry, based on the recommendations of lecturers, graduates and industry experts.

Within the framework of the professional Bachelor’s programme, students learn to do the following tasks and perform the following duties: design, development and modernization of mechatronic systems (including preparation of a technical task for the development or modernization of mechatronic systems); operation of mechatronic systems (including programming, setting and maintaining mechatronic systems); students learn to perform diagnostics, maintenance and repair of mechatronic systems (including ensuring compliance of the existing mechatronic system with requirements of the technological process); to participate in the development and provision of the company’s management system (i.e., to comply with the company’s management standards, to participate in the development and operation of the management system; to participate in the implementation and maintenance of the quality management system; to participate in the

improvement of the quality management system; to apply advanced optimization systems (for example, LEAN) to improve the production process); to ensure labour safety, environmental and civil protection requirements; students also learn to perform general tasks of ensuring professional activity: to communicate in the official language and two foreign languages, to use mathematical, natural sciences, engineering and technological competences at work, to use information and communication technologies, to improve their knowledge of novelties in the field of professional activity, to organize good practice experience exchange events and other company culture improvement activities, to comply with professional and general ethical principles, to comply with the norms of labour relations.

Outcomes of the professional Bachelor's programme "Mechatronics":

1. develop a production technological plan, evaluate the level of production automation, choose appropriate materials and elements, develop an automation process algorithm and prepare a technical assignment for equipment design, work with special design and mechatronic equipment control computer programs, choose the dimensions and tolerances of the adjustments during the design process;
2. compile computer programs for programming the control elements of automated systems;
3. prepare an economic justification for the equipment to be designed or manufactured and evaluate the most economically advantageous technical drawings;
4. organise and manage the work of staff, ensure compliance with environmental and occupational safety legislation, communicate in the national language and at least two foreign languages, know and understand plant safety legislation, be familiar with International Standards Organisation (ISO) quality safety and environmental protection systems;
5. perform a visual evaluation of the operation of mechatronics equipment, develop a monitoring and visualization system for mechatronic equipment, to navigate the issues of service, diagnostics and repair of automated equipment;
6. be familiar with the stages of design documentation, and understand the interaction between mechanical, electromechanical, electronic and computer equipment, use the laws, regulations, technical documentation and standards of the mechatronics sector necessary for the performance of work, and prepare technical documents, analyse, evaluate and apply scientific and applied research, use information search and retrieval tools, introduce new technologies and computer programmes;
7. perform a professional analysis of the work assignment, processing of information and matching of the work assignment to the technological possibilities of production, be able to predict the non-refusable operation of mechanical, electrical, electronic and computer equipment, make purposeful use of the capabilities of mechanical, electromechanical, electronic and computer equipment and organise its maintenance;
8. know how to select the components required for the automation process (hydraulic and pneumatic components, electrical and optical components, etc.);
9. designing the layout of any automated equipment or equipment to be installed and organising the division of labour between workers, use computer-aided design and computer-aided manufacturing (CAD/CAM) technologies for project development;
10. rationally organize the execution of interrelated work processes, prepare automation project materials for presentation.

The study programme outcomes are aligned to meet the objectives of the study programme. According to the mapping of the study programme, students' abilities to

develop a production plan and an automation algorithm, to select materials and elements, to prepare a technical task for designing equipment, to work with design programmes and to select alignment dimensions and tolerances are provided in courses such as: programming fundamentals, technical mechanics and material resistance, production and service organisation, automated design, creation of electrical documentation, PLC programming, design of automatic control systems, etc. The alignment of the overall course outcomes with the programme outcomes can be found in the programme mapping.

On 26 March 2021, the Study Programme Advisory Board was convened to review the content of the study programme with the help of industry representatives, to update it on labour market trends, to listen to students' suggestions and to define improvements to the content and format of the programme. For example, one of the recommendations from the industry representatives was to include smart technologies in the courses and to assess the need for a course in "Metalworking" and possibly replace it with an advanced course in electrical machines and electric drives. As a result, the course "Fundamentals of Electrical Machines" was introduced instead of the "Metalworking" course, and the course "Electric Drives" was supplemented with laboratory work required by the industry. The programme was also expanded with smart technology courses such as "Sensors and their applications" and "Internet of Things and sensor networks".

Refer to the annex for Informative report on the compliance of the study program with the state education standard (see Annex 27).

Refer to the annex for Informative report on the compliance of the qualification obtained in the study program with the professional standard (see Annex 28).

Refer to the annex for Study program plan (see Annex 29).

Refer to the annex for Descriptions of study courses of the study program (see Annex 30).

Refer to the annex for Mapping of study courses to achieve the study results of the study program (see Annex 31).

3.2.2. In the case of master’s and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation. In the case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels (if applicable).

3.2.3. Assessment of the study programme including the study course/ module implementation methods by indicating what the methods are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. In the case of a joint study programme, or in case the study programme is implemented in a foreign language or in the form of distance learning, describe in detail the methods used to deliver such a study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

Academic obligations of students and their fulfilment requirements within a specific study course are laid down in the course description. The course description is written by the lecturer in accordance with the guidelines approved by the vice-rector for academic and scientific affairs, then it is submitted to the Director of the study field, who, following the proposal of the council of the study field, forwards it to the Assembly of the faculty for approval. The study courses are organized in accordance with the regulatory enactments and the high standards established by ViA.

Educational content of the programme is acquired by practicing both passive and active forms of learning. Students acquire theoretical knowledge be means of lectures, seminars and independent studies. Practical skills necessary for the profession of a mechatronics engineer are developed and improved under the guidance of experienced industry specialists by means of laboratory demonstrations, practical classes, field trips, as well as during internships at industry companies.

Within the framework of the course, laboratory work, practical work, group work and internships contribute to the achievement of the results of the courses of study and the objectives of the study programme - through these methods theoretical knowledge and practical skills are consolidated and applied.

Course projects and research papers are written within the framework of the courses. Their purpose is to assess students' knowledge and skills in the relevant course, as well as to develop skills to suport their own opinion. The course project must address a specific problem. A student individually or in a group chooses a topic of the course project, which must be approved by the supervisor. Independent research conducted by students is an important part of the study process. An annual project must demonstrate the ability and skills of students to integrate theoretical knowledge acquired in previous study courses, skills and abilities acquired in the study process, to use them in practical research, to develop recommendations to implement research results in practice.

At the end of each study course, students take a written or oral examination and/or write a research paper, which must demonstrate theoretical knowledge acquired in the study course, abilities and skills to systematize knowledge and use it in research projects. A Bachelor's paper is a result of independent research conducted by a student bringing together theoretical knowledge acquired in various study courses. Based on the knowledge acquired, students conduct practical research.

Due to restrictions caused by Covid-19, lectures were organized in an online format using Webex / MS Teams or Zoom platforms. As there were no face-to-face classes, student feedback was especially important for the teaching staff to make sure students have learned and understood the material covered in classes. Remote consultations were provided to students, some of the lecturers used communication platforms popular among young people, where at the request of the students, they provided additional explanations about the material covered in the lecture – by using communication tools popular among young people, more successful communication was ensured, which resulted in better understanding and learning of the material. Students also appreciated the

use of such methods. It was difficult to do laboratory assignments due to the restrictions of COVID-19. The laboratory assignments were postponed to a time when the presence of students in the laboratory premises of ViA was allowed.

ViA ensures the implementation of the Programmes in such a way that the principles of student-centred education are taken into account in the implementation of the study process and students are encouraged to actively participate in the shaping of the study process. ViA respects the diversity of students' needs in the study process by choosing learning methods that suit them. ViA uses innovative pedagogical methods and an individual approach. Study programme directors ensure that lecturers involved in the implementation of the programme are familiar with the methods of assessing learning outcomes and are supported in developing their skills in this area; assessment criteria and methods, as well as the criteria for grading, are made public in advance; assessment provides students with the opportunity to demonstrate the extent to which they have achieved the learning outcomes; students receive feedback from lecturers who, where appropriate, provide advice on the study and research process; assessment is consistent, applied fairly to all students and implemented in accordance with the approved course descriptions. Appropriate procedures are in place to deal with student complaints, which are regulated by the Regulations on Studies and the Regulations on Ethics.

3.2.4. If the study programme envisages an internship, describe the internship opportunities offered to students, provision and work organization, including whether the higher education institution/ college helps students to find an internship place. If the study programme is implemented in a foreign language, provide information on how internship opportunities are provided in a foreign language, including for foreign students. To provide analysis and evaluation of the connection of the tasks set for students during the internship included in the study programme with the learning outcomes of the study programme (if applicable).

The Bachelor’s programme “Mechatronics” provides for three internships. Introductory internship of 4 weeks is planned in the 7th semester (4th study year). Its purpose is to provide students with the opportunity to work for the company in order to gain work experience and insight into the use of mechatronics systems of the company, work organization at the company, and to acquire professional skills.

Introductory practice tasks:
1. to become familiar with the structure, management organisation, activities, objectives and methods of the traineeship company or organisation;
2. to gain an understanding of the place and role of the enterprise in the national economy; to familiarise oneself with and comply with the work safety, fire safety, internal order and material responsibility regulations of the traineeship;
3. to become familiar with the use or development of mechatronic systems, equipment or processes in the enterprise or organisation;
4. perform auxiliary tasks in the maintenance of mechatronic equipment;
5. participate in the assembly of spare parts and the repair of equipment under the direct supervision of the staff responsible for the traineeship site.

Specialization internship of 8 weeks is planned in the 7th semester (4th study year). Its purpose is to

give students the opportunity to develop professional skills under the guidance of specialists working in the mechatronics industry and to participate in the work of a real company in accordance with the operational duties of a mechatronics engineer defined in the Occupational Standard.

Specialist traineeship objectives:
1. to become familiar with the structure, management organisation, activities, objectives and methods of the traineeship company or organisation;
2. to gain an understanding of the place and role of the enterprise in the economy;
3. to familiarise themselves with and comply with the rules of occupational safety, fire safety, internal order and material responsibility at the place of traineeship;
4. participate in the production or design process of the enterprise;
5. integrate into the work of the enterprise's unit and perform specific tasks using their knowledge, skills and competences;
6. to become familiar with the technological processes implemented in the enterprise;
7. to become familiar with the use or development of mechatronic systems, equipment in the enterprise or organisation;
8. learn and perform the functions of a mechatronic machine operator;
9. to learn the programming of the mechatronic equipment available at the workplace;
10. perform work related to the supervision, maintenance and repair of mechatronic equipment and participate in the provision of spare parts;
11. perform an individual task - designing or optimising the operation of a mechatronic machine or its individual components, improving the technological process of production;
12. participate in the preparation of the technical assignment for the project.

Pre-diploma internship of 8 weeks is planned in the 8th semester (4th study year) after completion of all theoretical courses. The purpose of pre-diploma internship is to offer an opportunity for students to participate in the development of a specific project, as well as in the preparation of technical documentation.

Undergraduate traineeship tasks:

1. to become familiar with the structure, management organisation, activities, objectives and methods of the traineeship company or organisation;

2. to gain an understanding of the place and role of the enterprise in the economy;

3. to familiarise themselves with and comply with the rules of occupational safety, fire safety, internal order and material responsibility at the place of traineeship;

4. follow the instructions and orders of the traineeship supervisor in the enterprise and other officials of the enterprise;

5. participate in the production or design process of the enterprise;

6. integrate into the work of the enterprise unit and perform specific tasks using their knowledge, skills and competences;

7. to perform an individual task related to the development of the diploma thesis - the design or optimisation of the operation of a mechatronic device or its individual components, the improvement of the technological process of production;

8. to prepare a traineeship report and to coordinate the information about the enterprise or organisation with the traineeship supervisor in the enterprise or organisation.

If project is implemented during the relevant internship to participate also in its implementation.

During internship, students fill in a diary, specifying what kind of duties were performed and how they succeeded. At the end of internship, students receive written feedback from their internship supervisors regarding their performance during internship.

At the end of internship, students submit an internship report, an internship diary, and an evaluation given by the internship supervisor. All three mentioned documents form part of the internship evaluation. Internship defence takes place before the internship defence commission.

The aims and objectives of the internship are defined on the basis of both the programme objectives and the tasks of a mechatronics engineer as defined in the professional standard, and therefore contribute to the achievement of all the defined study programme outcomes.
Some of the companies where students go on internships are international, such as VALMIERAS STIKLA ŠKIEDRA, where a lot of technical documentation is in German or English, or where the companies cooperate with foreign clients. Therefore, it can be said that the internship opportunities for foreign students are provided to the necessary extent. However, so far the study programme has been implemented only in Latvian.

Refer to the annex for the Internship Regulations for IT students (see Annex 61).

3.2.5. Evaluation and description of the promotion opportunities and the promotion process provided to the students of the doctoral study programme (if applicable).

3.2.6. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the marks of the final theses.

In June 2022, the first 13 students graduated with the Mechatronics Engineering qualification. Most of students either already work for industry companies (AS Valmieras Stikla Šķiedra, SIA Valpro, SIA Baltijas Industriālais Serviss, SIA Baltma, SIA Kulimeta Latvija, SIA Aloja Starkelsen, AS Sadales Tīkli, SIA Valmieras piens, etc.) or start working during internship, therefore topics of students' graduation papers are directly related to the current affairs of the industry, mainly they are related to the designing of mechatronic devices, installation and implementation of new equipment in production, automation of processes or modernization of devices already in production. Specific topics of the papers are related to PLC programming, design of mechanical parts, system drive calculations, development of process automation solutions, implementation of robotization solutions.

Topics of the graduation papers can be divided into the following 7 groups:

- Industrial automation
    - Glass drainage automation
    - Development of an automatic marine container charging equipment control system with automatic positioning against the loading truck
    - Automation of the packaging line. Capping of cylindrical packages
- Energy efficiency and renewable energy sources

- Incorporating heat generated by the compressor cascade into the heating system

- Internet of things, data collection
  - Development of a soil moisture sensor module for various solutions

- Sensors
  - Development of a soil moisture sensor module for various solutions
  - Producing of an automatic air permeability meter

- Agriculture and agricultural equipment
  - Automation of forestry processes

- Robots
  - A robot for placing a low-cost surface assembly components

- Equipment, processing equipment, equipment prototypes
  - Design and optimization of the automatic control system for the glue preparation deivce for a serial machine
  - Development of a touch pad prototype for learning mathematics
  - Transport drone
  - Development of digital control polystyrene foam cutting machine

The assessment of the thesis is based on its quality, as well as compliance with the methodological guidelines for students of the Faculty of Engineering and the requirements set out in the professional standard. The evaluation of the national examination papers is carried out by the national examination committee, which takes into account the evaluations of both the supervisor and the reviewer. Of all the papers, 31% were graded 9 (excellent) and 31% were graded 7 (good). 23% of the papers were graded 8 (very good). And 8% of the bachelor's theses were graded 10 (excellent), as well as 8% of the theses were graded 6 (almost good).

3.3. Resources and Provision of the Study Programme

3.3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples.

The following laboratories are available for the implementation of the programme: Laboratory of Electrical Engineering and Electronics, Mechatronics Laboratory, Laboratory of Virtual Reality and Augmented Reality, Smart Technology Laboratory.

ViA Library and Valmiera Integrated Library with their book collections, electronic catalogues and subscription and free access databases, as well as other information resources described in Chapter II are available to students. There are 234 book titles available in the library of Vidzeme University of Applied Sciences which directly refer to the programme “Mechatronics”.

The Laboratory of Electronics and Electrical Engineering has 11 workstations equipped with oscillographs, power supplies, signal generators and soldering stations. Equipment and components

for courses related to electronics and electrical engineering are available in the laboratory.

Three electric drive work stations, three automation stations and three pneumatic stations are available in the Mechatronics Laboratory. A sorting line is also available in the laboratory. As part of students' practical work, stands and equipment are prepared and used in the study process. If necessary, additional equipment is provided by the help of cooperation partners of the programme. Since 2020, there is a student workshop at the faculty, where students can implement programme-related projects in a practical way. Various tools, 3D printing equipment, CNC milling machine, and other prototyping devices and materials are available at the workshop. A large-scale project related to the course of electronics has been already implemented in the workshop: the lighting of the ViA building at Tērbatas Street 10. Apart from this, other projects have been also carried out in the workshop: design of a prototype of an IoT weather station, design of an electric drive stand for dynamics studies, and reconstruction of a conveyor line.

The Laboratory of Virtual and Augmented Reality has technical equipment and a VR tool developed by ViA that can be used to acquire the course of electrical machines and the course of production and service organization.

The existing facilities, such as computer equipment, Mechatronics, VR laboratory equipment, help students to learn both programming skills and the design and operation of mechatronic systems in a practical way and are sufficient to achieve the defined programme learning outcomes. For example, in the mechatronics laboratory, students work on electro-pneumatic systems and electric drive systems, thus acquiring practical skills that are useful for later work as a mechatronics engineer.

3.3.2. Assessment of the study provision and scientific base support, including the resources provided within the framework of cooperation with other science institutes and higher education institutions (applicable to doctoral study programmes) (if applicable).

3.3.3. Indicate data on the available funding for the corresponding study programme, its funding sources and their use for the development of the study programme. Provide information on the costs per one student within this study programme, indicating the items included in the cost calculation and the percentage distribution of funding between the specified items. The minimum number of students in the study programme in order to ensure the profitability of the study programme (indicating separately the information on each language, type and form of the study programme implementation).

ViA netiek nodalīta infrastruktūra pa studiju programmām, bet resursi novērtēti visai augstskolai kopumā. MT studiju programmas īstenošanai pieejamā bāze (auditorijas, datorauditorijas, laboratorija, bibliotēkas resursi, datorprogrammas) ir pietiekama.

See Part II, Section 2.3., paragraphs 2.3.1. to 2.3.3.

3.4. Teaching Staff

3.4.1. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

13 guest lecturers, 4 lecturers, 3 guest associate professors, 2 assistant professors, 1 associate guest professor, 1 professor are involved in the implementation of the study programme. 42% of the total number of the study programme's teaching staff are PhD holders. Of the teaching staff involved in the study programme, 7 are elected academic staff and 17 are non-elected. In total, 24 teaching staff are involved in the study programme.

All lecturers have the necessary academic and/or professional qualifications to fulfil the aims and objectives of the study programme and comply with all the requirements of the regulatory enactments. Each lecturer has the appropriate academic and/or professional qualifications to teach the specific course and, as a result, to contribute to the achievement of the overall learning outcomes.

ViA has established measures to verify that lecturers working with students have the necessary qualifications and competences, i.e:

- requirements are laid down in the ViA Regulations on Elections to Academic Positions;
- The ViA Salary Regulations contain the distribution of academic work, conditions for research work;
- student surveys for each course of study conducted by a lecturer in a given semester of the academic year; the Senate of ViA has approved the content of lecturers' work and duties, which determine the requirements for academic work, research, academic and scientific qualification and also administrative work;
- According to the Regulation of the Cabinet of Ministers of the Republic of Lithuania "On the education and professional qualifications required for teachers and the procedure for the development of professional competence of teachers", professional development may include international mobility, participation in projects and participation in conferences and seminars, as evidenced by the documents issued for professional development.

Taking into account the regulatory enactments developed by VIA, the teaching staff involved in the implementation of study programmes have the appropriate qualifications to participate in the implementation of the programme and to achieve the study results. The CVs of lecturers attached to the report contain detailed information on their professional qualifications - lecturers' work experience in the field and information on current developments in the field at their disposal are included in the study courses.

3.4.2. Analysis and assessment of the changes to the composition of the teaching staff

over the reporting period and their impact on the study quality.

The programme was licensed in the autumn of 2017. During the period of implementation of the programme, several lecturers were replaced due to various reasons, namely, due to health issues and heavy professional activity workload. However, despite the fact that some lecturers left their offices, other industry experts were found for the relevant courses, and they are fully capable of fulfilling their duties and ensuring the appropriate quality of studies. This is evidenced by the feedback provided by students at the end of each course and during the study process, and while communicating directly with the Director of the programme.

During the reporting period, the course Internet of Things and Sensor Networks was taught by the international collaborator Razvan Bogdan, PhD. Dr.sc.ing. Aigars Vītols was engaged for the course Electrical Engineering, as well as PhD Mikus Vanags for the courses Programming Fundamentals and Programming C++ and PhD Kristaps Vītols for the courses Sensors and Their Application and Creating Electrical Documentation (English). Renārs Vītols (Theory of Machines and Mechanisms, Alignments, Tolerances and Technical Measurements (English), Automated Design (English), Computer Programs in Engineering Mechanics (English), Mechanical Drafting (English)), Laima Briede-Bērziņa (Creating Electrical Documentation (Latvian)), and Dr. Ritvars Rēvalds (Automation Elements, their Construction, Operation, Application, PLC Programming I, PLC Programming II, Visualisation of Industrial Automated Processes), Toms Amsons (Computer Architecture II), Āris Aldiņš (Basics of Computer System Administration), Inese Purvmale (Physics I, Physics II), Peteris Sidorenko (Project Management in Engineering).

3.4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals or peer-reviewed monographs may be additionally specified. Information on the teaching staff included in the database of experts of the Latvian Council of Science in the relevant field of science (total number, name of the lecturer, field of science in which the teaching staff has the status of an expert and expiration date of the Latvian Council of Science expert) (if applicable).

3.4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

3.4.5. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study programme and study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

There are 24 lecturers involved in the implementation of the programme “Mechatronics”, of which 7 lecturers are elected to academic positions. The ratio of the number of students and lecturers in the programme is approximately 1:1.

Mutual cooperation of the teaching staff can be assessed as good in terms of course inspection and supervision and review of project papers and graduation papers. To adjust educational content, the Director of the programme invites lecturers of the thematic modules to joint discussions with the aim of specifying preliminary knowledge (from the courses of the previous semesters) necessary for the implementation of each study course, thus maximizing the effectiveness of the course implementation.

The Programme Director supervises and manages the interconnection of study courses, and the Programme Director facilitates, where necessary, the cooperation between teaching staff. Course descriptions specify the prerequisites for successful completion of the course, so that the interlinkages between courses can be tracked. During the implementation of the European Social Fund project "Development of academic staff and human resources of Vidzeme University of Applied Sciences" (SAM 8.2.2.), from 2018 to 2021, a general cross-hospitalization of lecturers' classes took place, during which the practice of cross-observation of classes was initiated as one of the measures to promote mutual cooperation between lecturers.
In turn, the meetings of the Direction Council, the Faculty Council and the General Meetings of the Faculty promote cooperation between teaching staff in the context of the programme, the direction and the Faculty. At the end of the calendar year, all faculty members involved in the study programmes have the opportunity to participate in a Faculty Council meeting or a general meeting during which the programme directors report on current developments, student evaluations and challenges in the implementation of the study programme.

Annexes

III - Description of the Study Programme - 3.1. Indicators Describing the Study Programme		
Sample of the diploma and its supplement to be issued for completing the study programme	26P_MT_Diploma-paraugs_Diploma-example-red.zip	26P_MT_Diploma-paraugs_Diploma-example-red.zip
For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions (if applicable)		
Compliance of the joint study programme with the provisions of the Law on Higher Education Institutions (table) (if applicable)		
Statistics on the students in the reporting period	2P-Studentu-statistika-2013-2022-AIKA-visi-StudentStatistics-corr.xlsx	2P-Studentu-statistika-2013-2022-AIKA-visi-StudentStatistics-corr.xlsx
III - Description of the Study Programme - 3.2. The Content of Studies and Implementation Thereof		
Compliance with the study programme with the State Education Standard	27P_MT_atbilstība valsts standartam_Compliance_LV_ENG_red.doc	27P_MT_atbilstība valsts standartam_Compliance_LV_ENG_red.doc
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard or the requirements for professional qualification (if applicable)	28P_MT_Prof.stand_Compliance-prof-stand-LV_ENG-red.xlsx	28P_MT_Prof.stand_Compliance-prof-stand-LV_ENG-red.xlsx
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	30P_MT_Kursu_apraksti_Course_Descriptions.zip	30P_MT_Kursu_apraksti_Course_Descriptions.zip
The curriculum of the study programme (for each type and form of the implementation of the study programme)	29P_MT_Studiju plāns_Study_Plan_LV_ENG-red.xlsx	29P_MT_Studiju plāns_Study_Plan_LV_ENG-red.xlsx
Descriptions of the study courses/ modules	31P_MT_Kartējums_Mapping_red.xlsx	31P_MT_Kartējums_Mapping_red.xlsx
Description of the organisation of the internship of the students (if applicable)	61P_Internship_IF_students_ENG.docx	61P_Prakšu_nolikums_IF_studentiem.docx
III - Description of the Study Programme - 3.4. Teaching Staff		
Confirmation that the academic staff of the doctoral study programme includes not less than five doctors, of which at least three are experts approved by the Latvian Council of Science in the branch or sub-branch of science in which the study programme intends to award a scientific degree (if applicable)		
Confirmation that the academic staff of the academic study programme complies with the requirements specified in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions (if applicable)		

Cybersecurity Engineering (47482)

Study field	*Information Technology, Computer Hardware, Electronics, Telecommunications, Computer Management, and Computer Science*
ProcedureStudyProgram.Name	*Cybersecurity Engineering*
Education classification code	*47482*
Type of the study programme	*Professional master study programme*
Name of the study programme director	*Inese*
Surname of the study programme director	*Džarcāne*
E-mail of the study programme director	*inese.dzarcane@va.lv*
Title of the study programme director	*Mg.sc.soc.*
Phone of the study programme director	*+371 29559788*
Goal of the study programme	*To provide students with the opportunity to acquire the competences necessary for a security tester/information systems security manager, information systems security manager and to prepare them for professional work in information security and cyber security in a company and/or organisation.*
Tasks of the study programme	*- To provide students with practice-oriented higher professional education in the fields represented by the field of study;* *- To ensure a study process that meets the requirements of the legislation, the labour market and a student-centred approach to higher education;* *- To develop students' scientific research skills, to create motivation for further education and to encourage students' further self-education;* *- Ensure the development of diverse personal skills;* *- To create an adaptable training offer for companies and their employees in the field of study specialisations.*

Results of the study programme	*KNOWLEDGE:* *1. knowledge of cyber defence and information security policies, procedures and regulations.* *2. Knowledge of the systems engineering process.* *3. Knowledge of ethical hacking principles and techniques.* *SKILLS:* *4. The skills to determine how a security implementation should work (including system resilience and reliability), and the skills to determine how changes in operations or the environment may affect it.* *5. the skills to implement, maintain and improve existing web security mechanisms* *6. the ability to apply security testing tools and techniques.* *COMPETENCES:* *7. Competence to understand and apply laws, regulations, policies and guidelines that are relevant to the organisation's cyber security objectives.* *8. Competence to apply best practices in implementing security controls that incorporate software development methodologies, systems and security development principles, secure design, secure architecture and secure programming guidelines.* *9. Competence to evaluate the effectiveness of security controls at management, operational and technical levels. In addition, to assess whether controls are implemented correctly and whether they fulfil their intended purpose based on the defined security requirements.*
Final examination upon the completion of the study programme	*Master's Thesis*

Study programme forms

Full time studies - 2 years - latvian

Study type and form	*Full time studies*
Duration in full years	*2*
Duration in month	*0*
Language	*latvian*
Amount (CP)	*80*
Admission requirements (in English)	*A professional bachelor's degree, a second-level professional or equivalent higher education qualification in information technology or information and communication technology or an equivalent field, completed on a full-time basis in a programme of study of at least four years' duration*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Professional Master's degree in information technology*
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Vidzeme University of Applied Sciences	VALMIERA	CĒSU IELA 4, VALMIERA, VALMIERAS NOVADS, LV-4201

Full time studies - 2 years - english

Study type and form	*Full time studies*
Duration in full years	*2*
Duration in month	*0*
Language	*english*
Amount (CP)	*80*
Admission requirements (in English)	*Professional bachelor's degree, second level professional or equivalent higher education qualification in information technology or information and in information and communication technologies or an equivalent field, following completion of a programme of study of at least four years' duration on a full-time basis; Level of English language proficiency at least at B2 level*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Professional Master's degree in information technology*
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Vidzeme University of Applied Sciences	VALMIERA	CĒSU IELA 4, VALMIERA, VALMIERAS NOVADS, LV-4201

3.1. Indicators Describing the Study Programme

3.1.1. Description and analysis of changes in the parameters of the study programme made since the issuance of the previous accreditation form of the study field or issuance of the study programme license, if the study programme is not included on the accreditation form of the study field, including changes planned within the evaluation procedure of the study field evaluation procedure.

The study programme accreditation experts recommended in their report to increase the number of credit points for individual study courses, as well as to combine some study courses due to content overlap. The number of credit points was increased for five courses, while four courses of the block of social sciences were removed from the study plan – these changes were made based on the course evaluation survey in which students pointed out that the content of these courses overlapped with other courses of the programme, as well as on the basis of student recommendations to increase the proportion of engineering courses in the programme.

Changes in the amount of CP:

- Applied cryptography: increased from 2 CP to 4 CP.
- Reverse engineering; increased from 1 CP to 2 CP
- Security of networks, mobile and cloud computing; reduced from 3 CP to 2 CP
- Information gathering techniques; increased from 1 CP to 2 CP
- Cyber crime investigation; increased from 2 CP to 4 CP

Changes in course titles:

- The course “IT Security, Administration and Protection” has been renamed to “Introduction to Cyber Crime Investigation” in the amount of 2 CP
- The course “Software Security Design” has been renamed to “Secure Software Development”
- Courses “Project Management Methods and Tools”, “Innovations and Creative Problem Solving” are combined under the course “Innovations and Project Management”
- It is planned to combine courses *“Security Incident Management”* and *“Penetration testing”* into one course

Courses removed from the programme:

- Economics for Entrepreneurs
- Communication Theory
- Social Media Analysis
- Internet Psychology

New courses included:

- “Engineering of Cybersecurity Requirements” in the amount of 2 CP
- “Research Methodology and Scientific Publications” in the amount of 2 CP

Changes to course division in Parts A, B, C:

- The course “Data Mining” is included in Part A
- The course “Applied Cryptography” is included in Part A

- The course “Introduction to Propaganda and Persuasive Communication” is included in Part C

- The course “Python for Penetration Testers” is included in Part B

Changes have also been made to the admission requirements – from now on, when applying for studies, only the weighted average grade specified in the diploma supplement and admission interview will be taken into account. Previously, in addition to the already mentioned criterion, potential students had to present a topic of the Master's paper, providing an insight into the topicality of the paper, specifying the purpose of the paper and relevance of the topic. Due to the fact that all students of the programme change the topics of their Master's papers during their studies, there is no sense to request a topic presentation upon applying to ViA.

3.1.2. Analysis and assessment of the study programme compliance with the study field. Analysis of the interrelation between the code of the study programme, the degree, professional qualification/professional qualification requirements or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements. Description of the duration and scope of the implementation of the study programme (including different options of the study programme implementation) and evaluation of its usefulness.

Cybersecurity is closely and inseparably related to the ICT industry – according to the European Parliament's definition, "Cybersecurity includes information and communication security, operational technologies and IT platforms necessary to ensure the security of digital systems". Information technology systems, platforms, hardware, software and the data stored on them can be the target of cyber-attacks. Information technology security measures, or cybersecurity, ensure that IT systems are protected against attacks and threats.

As the use of ICT and technological development are rapidly growing, more and more sectors of the national economy and processes are becoming dependent on digital technologies. Along with the development of technologies and the rapid increase in the number of users, cybersecurity risks and attempts to threaten both the systems themselves and their users are also increasing. Therefore there is a need for highly qualified cybersecurity professionals. Cybersecurity becomes vital in cyber-physical systems, where physical security cameras, notification systems, even gates, building doors, and many other physical items are powered by ICT infrastructure, servers, and systems of the Internet of things.

The full title of the Master's study programme at VIA is "Cybersecurity Engineering". Upon successful completion of the programme, the student is awarded a professional Master's degree in Information Technologies. The title of the study programme, 'Cybersecurity Engineering', is closely and inextricably linked to the Information Technology sector. Therefore, the content of the study programme is based on the study of subjects related to the IT sector and cyber security.

The goal of the programme is to provide students with the opportunity to acquire competences necessary for a penetration tester / information systems security manager, information system security officer, and to prepare them for professional activity in ensuring information security and cybersecurity of a company and/or organization.

The programme promotes the integration of courses, an interdisciplinary approach ensuring the development of the necessary competencies for a penetration tester and a cybersecurity specialist.

As a result of successful completion of the programme, students will be able to perform the duties and main tasks of a penetration tester, information systems security manager, and information systems security officer.

The programme includes subjects that require prior IT knowledge, therefore one of the admission requirements is a professional Bachelor's degree, second-level professional or equivalent higher education in information technologies or information and communication technologies or an equivalent field, with completion of at least four years of full-time study programme. If the Bachelor's degree was awarded to the potential student in another discipline of science, but his or her professional activity is related to the field of cybersecurity or IT, a committee appointed by the Director assesses whether the applicant's current work experience and professional knowledge are appropriate for entry to the programme. Entrance interviews are scheduled with all reflectants, during which the student's motivation to study is assessed, and insight is gained into their professional experience in the field of information technology.

The programme is offered as full-time studies – duration of the programme is four semesters, lectures are planned in three of them, while the fourth semester is dedicated to the writing of the Master's paper and the completion of the Part C course. The content and scope of the programme correspond to a Master's programme – as a result of successful completion of the programme, 80 CP are obtained and a professional Master's degree in Information Technologies is awarded, which entitles the holder to continue education in a doctoral programme if the admission requirements of the relevant programme are met.

Refer to the annex for the Sample of the diploma and its supplement to be issued for mastering the study program (see Annex 34).

3.1.3. Economic and/ or social substantiation of the study programme, analysis of graduates' employment.

During the reporting period, the demand for cybersecurity specialists has only grown.

In accordance with the industry assessment carried out by the professional association ISC2, there are currently 2.72 million unfilled cybersecurity job vacancies worldwide; it is predicted that demand for cybersecurity professionals will grow by as much as 65% over the next decade. *Cybersecurity Ventures* predicts that by 2031, ransomware will attack one of the world's companies and/or individuals every 2 seconds compared to an interval of 11 seconds in 2021. Consequently, companies will have to pay more attention to the security of their systems and also their customers in the Internet environment.

Furthermore, *Cybercrime magazin* predicts that in 2025 it will be necessary to protect 200 zettabytes of data from cyber attacks, 50% of which will be stored in the cloud. In its forecasts, the European Commission indicates that by 2024, 22.3 billion devices worldwide will be connected to the Internet of Things (*consilium.europa.eu*), thus creating an even greater number of potential vulnerabilities and cyber attacks; accordingly, the need for experienced specialists who can protect systems and prevent the threat of cyber attacks will only increase every year.

The global crises of the past three years have further emphasized the importance of cybersecurity; cyberwarfare has become real. In accordance with the Cyber Security Strategy of Latvia for 2019-2022, cybersecurity is an element of comprehensive national defence, the importance of which will continue to grow not only locally, but even internationally. Therefore, it is necessary to strengthen and develop cyber defence capabilities, increase resilience against cyber attacks and promote public awareness of threats in cyberspace.

At the time of the preparation of the report, the National Cybersecurity Law is at the development stage, the purpose of which will be to improve the security of information and communication technologies, establish procedures for ensuring cybersecurity measures and promote the implementation of cybersecurity measures in such a way as to be able to predict and prevent cyber threats in time, as well as to overcome them and eliminate their consequences, as much as possible ensuring continuity of service availability.

The European Parliament is also working on the new NIS2 directive (The Network and Information Security Directive), which will oblige several industries and structures to take measures to increase the level of cybersecurity in Europe.

It is expected that upon the entry into force of the law and the directive, the demand for qualified specialists, who will be able to fulfil the requirements set out in the mentioned regulatory enactments, will increase in the labour market.

Therefore, it can be stated that the development of the programme is justified by the rapidly growing demand for cybersecurity specialists, the programme meets the demand of the labour market and prepares specialists who are critically needed and in demand in the industry.

During the reporting period, the first students graduated from the programme in June 2020. In the last three years, 11 students have graduated from the programme, 1 of them is a female graduate.

More than 90% of job duties of the graduates are related to IT and cybersecurity. All of them continue their professional activities in Latvia. The majority of graduates (60%) are employed in the private sector and their job duties are directly related to IT and cybersecurity; 40% work for public institutions, and their job duties are related to the security of IT systems. 36% of graduates changed their workplace after completing their studies, switching to a better-paid position.

During the reporting period, two of the graduates have been involved in the implementation of the programme as lecturers, improving the content of the programme. One of the graduates is a visiting lecturer of the professional Bachelor’s programme “Information Technologies”.

3.1.4. Statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down into different study forms, types, and languages.

The programme is taught in Latvian and English, the mode of studies – full-time studies. Students have been admitted to the programme since 2018. During the reporting period, 40 students were admitted to the programme, of which 4 were female students.

The students admitted to the programme represent all regions of Latvia: most students are from Vidzeme region – 64%, of which 43% live in Riga and Pierīga, while 21% represent cities of Vidzeme region; 10% of students are from Kurzeme, 7% – from Zemgale, and 5% – from Latgale.

During the reporting period, 7 international students applied to the programme, 5 were accepted and signed the study documents. The largest proportion of international students is from Ukraine (4) and one student is from Albania; the remaining two students represent Ukraine, but they did not participate in acquiring of the study programme. As there are international students admitted to the programme, it is taught in English.

Upon assessing admission results during the reporting period, it can be concluded that Latvian nationals choose only State budget funded study places.

All students of the programme are working in the IT industry or they are IT-related professionals. The average age of the students is 35 years, which shows their high motivation to acquire additional knowledge in cybersecurity and improve their professional performance.

At the time of preparation of the report, 18 students are admitted to the programme. Four of them took a study break, which is related to the increasing workload in the context of global events. The Covid 19 pandemic and the transition to remote working caused by it, as well as the war caused by Russia in Ukraine, affected those studying in the programme. Reasons for a study break in all cases are related to the increasing professional workload – for one part this means additional duties due to holding of more than one job, while the other group was significantly affected by the increase in the number of cyber attacks in the context of the war in Ukraine carried out by Russia, as a result of which students were forced to take an academic break in order to be able to fulfil their professional duties related to dealing with and preventing cyber attacks and ensuring/maintaining security of information systems.

During the reporting period, 11 students dropped out of the programme (were discharged), 3 of them were female students and 8 were male students. Reasons for dropping out in most cases are related to difficulties in combining professional-study-family life, as a result of which a decision is made in favour of family/professional life, and also to mental health problems. It is very rarely when the reason for dropping out is an incorrectly chosen programme.

Refer to the annex for student number dynamics during the assessment period (see Annex 2).

3.1.5. Substantiation of the development of the joint study programme and description and evaluation of the choice of partner universities, including information on the development and implementation of the joint study programme (if applicable).

3.2. The Content of Studies and Implementation Thereof

3.2.1. Analysis of the content of the study programme. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators with the aims of the study course/ module and the aims and intended outcomes of the study programme. Assessment of the relevance of the content of the study courses/ modules and compliance with the needs of the relevant industry, labour market and with the trends in science on how and whether the content of the study courses/ modules is updated in line with the development trends of the relevant industry, labour market, and science.

The planned learning outcomes correspond to the Qualifications Framework of the European Higher

Education Area (Bologna Process) and the European Union's Qualifications Framework for Lifelong Learning (EQF level 7). The competencies to be acquired within the framework of the courses of the programme are based on the Penetration Tester Competence Map, according to NIST 800-181.

The content of the programme ensures the acquisition of knowledge, skills and competences necessary for performing professional activities in accordance with knowledge, skills and competences laid down in the LQF level 7 of the Latvian education classification.

The programme consists of the study courses that help to acquire:

- the latest developments in the theory and practice of the industry (Strategic information and communication technology (ICT) management; Information security risk management; Cybersecurity policy; Network application security testing; Network, mobile device and cloud computing security; Secure software development; Personal data protection and investigation)
- knowledge, skills, competencies necessary for the profession (Security incident management; Python for penetration testers; Cybersecurity policy; Cybersecurity requirement engineering; Cybercrime investigation; Information system security engineering; Ethical hacking; Reverse engineering; Network application security testing; Information gathering techniques)
- study courses related to research, creative work, design work and management (Innovations and project management; Security culture; Research methodology and scientific publications; Data mining; Management of Strategic Information and Communication Technologies (ICT); Management of information security risks)
- pedagogy and psychology courses (Safety culture; Persuasive communication; Duties, rights and responsibilities on the Internet);

The courses integrate a set of competencies required for both a penetration tester and an information systems security manager. Such an integrated approach ensures a case study and acquisition of practical skills. By following the current trends of the labour market, as well as responding to the security situation in the world, the following aspects are acquired in-depth: system security and preparation of security documentation for the accreditation and audit process, the basics of cybercrime investigation, communication skills, problem solving and critical thinking.

As a high percentage of professionals are involved in the implementation of the study programme, they include in their courses up-to-date information from the industry, such as analysing recent cyber-attacks and their types, trends, blatant security breaches, examples from their professional experience. The practical section includes so-called "case studies". During the study visits, students visit companies in the sector and have the opportunity to meet the responsible heads/employees of the Cyber Security Departments, ask questions and learn about the latest developments in the sector, trends, main types of threats, measures to prevent them, etc., through discussions/conversations. Information on current developments in science and research is obtained from lecturers who are involved in research projects and research, e.g. one of the lecturers is involved in a project on enhancing the cybersecurity capabilities of society, while another lecturer has experience in working in a cybercrime laboratory. In addition to the above, the study programme invites guest lecturers from external organisations, such as in 2021 a lecturer from a foreign university's Cyber Security Study Programme gave a lecture on Cyber Security risks; in 2022 a guest lecture on industry-specific software was organised for students.

Starting with the 2018/2019 academic year, the project "Establishment and validation of new Master's study programmes to enhance the international competitiveness of Vidzeme University of Applied Sciences" (No.8) under the "Growth and Employment" Special Support Objective 8.2.1 (SAM) "Reduce fragmentation of study programmes (SP) and strengthen sharing of resources" was

implemented in the framework of the project "Establishment and validation of new Master's study programmes to enhance the international competitiveness of Vidzeme University of Applied Sciences" (No.8 .2.1.0/18/A/011)), activities are being implemented within the framework of the programme, which are aimed at improving the content of the study programme and updating the organisational issues in accordance with the needs of the field and the latest scientific trends. Within the framework of the project, hospitalization visits were carried out in some study courses - during these visits lecturers from other study programmes visited the specific lecture in order to assess its quality: course content, lecturer's work, applied methods, students' involvement. At the end of the hospitalization, a hospitalization report was submitted to the study programme director, who assessed it and, if necessary, discussed the shortcomings identified in the report with the lecturer of the specific course.

The study programme has a programme advisory board, which includes professionals/company representatives in the field of Cyber Security and IT. The representatives of the Council provide information on the current trends in the sector and the skills required according to market trends as well as market needs. Based on the information provided by the Council, the Council also discusses the alignment of study aims and objectives, as well as the chosen study methods, with the needs of the labour market. One of the recommendations of the Advisory Board, as well as of the National Examination Commission, concerns the positioning of the study programme and its possible future direction. The most important proposals include the need to structure the study content into thematic modules, as well as to include an additional thematic course in the programme content.

Learning outcomes of the programme in terms of knowledge, skills and competences:

Knowledge:

- Knowledge of cybersecurity and information security policies, procedures and regulations

Knowledge and understanding of the issues of technical provision, security strengthening and their impact on ensuring the operation of company/organization, competitiveness and development, stable and sustainable operation of e-services;

Understanding of safety standards and their application in practice;

Knowledge and understanding of the impact of information security incidents in the organization, their processing procedure, involved parties, regulatory framework in the Republic of Latvia, and incident reporting procedures;

Knowledge and understanding of the safety culture and scope of safety training; the importance of human actions and habits in information security processes.

- Knowledge of systems engineering process.

  Understanding of the operation principles of networks and mobile networks

- Knowledge of ethical hacking principles and techniques.

Skills:

- Skills to determine how security implementation should work (including system resiliency and reliability), as well as skills to determine how operational or environmental changes may affect it.

Understanding of the safety culture and scope of security training; the importance of human actions

and habits in information security processes;

Ability to independently identify and critically analyze risks related to cybersecurity, to determine and monitor measurements for assessing the achievable results of information security management;

Ability to recognize, analyze and assess organizational cybersecurity threats, potential attack vectors and prevention principles;

Ability to collect evidence in the event of incidents, trace the progress of an attack, perform preventive actions and, if necessary, run system recovery.

- Skills to implement, maintain and improve the existing web security mechanisms

Upon implementing information security risk management, a student can independently apply information security tools and methods to protect critical resources of the company/organization;

Ability to evaluate and analyze information and cybersecurity risks in the management of ecosystems of cloud services and Internet of things;

- Abilities to apply penetration testing tools and techniques.

Competences:

- Competence to understand and apply laws, regulations, policies and guidelines relevant to the cybersecurity objectives of the organization.

Ability to analyze and assess results achieved, to take decisions, to develop and implement necessary risk mitigation measures;

Ability to cooperate, communicate, advise, explain and substantiate goals and results of information security protection measures to interested parties.

- Competence to apply good practices in implementing security controls, including software development methodologies, system and security development principles, secure design, secure architecture, and secure programming guidelines.

Ability to recognize, analyze and assess threats to the organization's information security and cybersecurity, build the organization's cyber resilience

- Competence to assess security controls effectiveness at the management, operational and technical levels. Apart from this, to evaluate whether the controls have been implemented correctly and whether they fulfil the intended task based on the established security requirements.

Ability to prepare, analyze and assess information security training programmes, to measure and improve their results

End-of-semester discussions with students are held every year. Afterwards student recommendations are discussed at the faculty level with teaching staff and administrative staff, and feedback is provided to students.

Furthermore, challenges related to the programme, its compliance with the requirements of the industry, as well as potential improvements to the programme are discussed at the meetings of the Advisory Council, as well as with the members of the State Examination Commission. The Advisory Council consists of student representatives, industry representatives, a graduate from the programme, a representative of the teaching staff of the programme and the Director of the study programme.

In the period from the academic year of 2018/2019 until the time of preparation of the report, by support of the specific support objective "Establishment and Approval of New Master's Study Programmes to Promote International Competitiveness of Vidzeme University of Applied Sciences" (Nr.8.2.1.0/18/A/011) of the project, activities are implemented within the framework of the programme aimed at updating the content and organizational aspects of the study programme in accordance with the needs of the industry and the latest scientific findings.

Refer to the annex for compliance with the Safety Tester Competency Card, according to NIST 800-181 (see Annex 32).

Refer to the annex for Informative report on the compliance of the study program with the state education standard (see Annex 35).

Refer to the annex for Study program plan (see Annex 36).

Refer to the annex for Descriptions of study courses of the study program (see Annex 37).

Refer to the annex for Mapping of study courses to achieve the study results of the study program (see Annex 38).

3.2.2. In the case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation. In the case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels (if applicable).

The Master's degree is awarded based on the achievements and findings in the scientific field. The programme does not confer a qualification; courses of the originally intended specialization – cybercrime investigation – are already included in the programme. The directions of possible specialization will be addressed in the following periods, taking into account trends in the field of cybersecurity, as well as labour market forecasts and the possible demand for specialists of a certain specialization.

The teaching staff of the programme is also involved in the research sub-direction "Modelling and safety of simulations of socio-technical systems". The research sub-direction is focused on interdisciplinary research, which includes the assessment of engineering and technological solutions in the social system and the assessment of social science research results using simulation modelling technologies, as well as company modelling methodologies. Several main research tasks are defined under the research sub-direction, one of which is prediction and modelling of system security and vulnerability.

The international project "Advancing Human Performances in Cybersecurity" (Advances) is also being implemented in the framework of the research sub-direction. The project will address the urgent need for a scientific understanding of human limitations and capabilities in the cyber attack chain by studying human behaviour in cyber security, combining research in computer science, psychology and human genomics. As a result of the project, a set of methodologies and tools will be developed, which will include specific software components for data collection and analysis, self-report tools to collect actual data on social behaviour patterns.

3.2.3. Assessment of the study programme including the study course/ module implementation methods by indicating what the methods are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. In the case of a joint study programme, or in case the study programme is implemented in a foreign language or in the form of distance learning, describe in detail the methods used to deliver such a study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

Academic obligations of the students and their fulfilment requirements within a specific study course are laid down in the course description. The course description is written by the lecturer in accordance with the guidelines approved by the vice-rector for academic and scientific affairs, and submitted to the Director of the study field, who forwards it to the assembly of the faculty for approval based on the proposal of the council of the study field.

Classes of the programme “Cybersecurity Engineering” are held on Friday evenings and Saturdays. Courses are organized in accordance with the regulatory enactments and the standards established by ViA.

Study methods include:

- face-to-face/online contact classes with lecturers, performance of practical work
- Independent work
- Field trips, visits to companies;
- Internship at the company.

The main teaching methods: lectures, work with literature, practical classes, which can be organized as group work and individual work of different formats – case studies, discussions, presentations of independent work, tests, as well as work in virtual laboratories. The amount of practical classes is not less than 30%.

Laboratory works, practical works, group works and internships implemented in the study programme contribute to the achievement of the study course results and study programme objectives - through these methods the theoretical knowledge acquired in the study courses is applied in practice and strengthened, providing students with an understanding of the operation of specific systems and processes. As the study programme is professionally oriented, almost all courses require theoretical knowledge to be reinforced in practice, so the use of these methods in the context of the study programme is essential.

During the reporting period, one group of students (2020) experimentally participated in a virtual/remote international hacker game/hackathon, where they together with the students of the network of partner universities tested their knowledge by solving critical real-life cybersecurity situations.

The teaching staff involved in the programme actively asks students to engage in dialogue, encouraging them to get involved in the study process, express their opinion and debate. Since the students of the programme have already accumulated certain professional experience, they are actively involved in the study process, thus improving it; accordingly, the teaching staff of the programme takes into account peculiarities of each specific group and respects their needs.

Students’ independence is encouraged throughout the study process, as a certain amount of material must be learned individually by reading industry literature or specialized teaching aids;

their analytical thinking is encouraged by involving them in exploring case studies. During the study process, mutual respect in the relationships between students and teaching staff is promoted; if, however, any ambiguities or disagreements arise during the studies, they are resolved in accordance with the procedures established by ViA and respecting the opinion of both parties involved.

ViA ensures the implementation of the Programmes in such a way that the principles of student-centred education are taken into account in the implementation of the study process and students are encouraged to actively participate in the shaping of the study process. ViA respects the diversity of students' needs in the study process by choosing learning methods that suit them. ViA uses innovative pedagogical methods and an individual approach. Study programme directors ensure that lecturers involved in the implementation of the programme are familiar with the methods of assessing learning outcomes and are supported in developing their skills in this area; assessment criteria and methods, as well as the criteria for grading, are made public in advance; assessment provides students with the opportunity to demonstrate the extent to which they have achieved the learning outcomes; students receive feedback from lecturers who, where appropriate, provide advice on the study and research process; assessment is consistent, applied fairly to all students and implemented in accordance with the approved course descriptions. Appropriate procedures are in place to deal with student complaints, which are regulated by the Regulations on Studies and the Regulations on Ethics.

Within the framework of certain courses, students have the opportunity to go on a field trip to the largest companies in the industry, visit their Data Centres, as well as meet with the company’s cyber security experts to discuss current events and challenges in the industry. Furthermore, the purpose of internship is to provide an opportunity for students to test their knowledge, apply acquired skills and develop competences in practice.

Due to the Covid-19 pandemic, the study process was shifted from face-to-face to remote learning. Such an approach turned out to be very suitable for industry professionals studying in the programme, who indicated the remote study format as one of the advantages of the programme in the end-of-semester discussions, which allows them to more successfully combine their professional and family life and studies. This aspect allowed attracting students from more distant regions – Kurzeme and Latgale.

Thus, it can be concluded that the form of remote studies, including remote connecting to the Cybersecurity Laboratory, promotes student involvement in the programme, timely attendance of lectures and allows students to plan their time more successfully, including setting aside more time for course assignments and homework.

Since international students have been admitted to the study programme during the reporting period, lectures in specific groups with international students are given in English. The use of English in the IT industry is one of the necessities, so students, in addition to the professional knowledge, also learn the necessary industry terminology and practice language usage.

3.2.4. If the study programme envisages an internship, describe the internship opportunities offered to students, provision and work organization, including whether the higher education institution/ college helps students to find an internship place. If the study programme is implemented in a foreign language, provide information on how internship opportunities are provided in a foreign language, including for foreign students. To provide analysis and evaluation of the connection of the tasks set for students during the internship included in the study programme with the learning

outcomes of the study programme (if applicable).

The programme provides internship in the amount of 6 CP, which corresponds to 6 weeks. Internship is included in the 3rd semester of the study plan and is defended in December.

Before starting internship, students submit internship information to ViA by filling in the internship application form developed by ViA.

During internship, students write an internship report in which they record tasks performed, the degree of difficulty, and solutions.

Internship requirements are laid down in the Internship Regulations approved at the meeting of the Assembly of the Faculty of Engineering. The goal of internship is to provide an opportunity for students to get to know the management structure and operating principles of a particular organization and to consolidate theoretical knowledge acquired in the study programme, to improve practical skills needed for specialists of the relevant field, and to develop proposals for the improvement of cybersecurity processes.

The internship programme includes tasks from the mandatory study courses. The content of the internship programme integrates the following knowledge, skills and competencies required for a cybersecurity specialist, a penetration tester:

- To analyse various security management systems: information system operation, structure (architecture), information flow, user behaviour, business risks, functional and non-functional information system requirements, to identify and assess gaps, to analyse processes, to develop proposals for their improvement;
- To analyse the existing information security controls or to develop new ones; to assess security risks of information systems;
- To plan and develop testing scenarios of different levels (white box / black box) subject to the company’s privacy policy, based on existing limitations (industry, compliance, specificity), taking into account results of risk analysis, based on the information classification;
- To learn social engineering techniques and recognize risks associated with them; to understand how they can be reduced within the company environment.
- To present results, communication, data visualization.

The tasks of the internship are related to the study outcomes of the study programme and include knowledge, skills and competences defined in the study programme, for example, the analysis of security management systems and the tasks included in it correspond to the study programme outcome on the acquired knowledge in cyber defence and information security procedures, as well as the competence to assess the effectiveness of security controls at the management, operational and technical levels and to provide their evaluation. Successful performance of the above activities requires competence in understanding and applying laws, regulations, policies and guidelines that are relevant to the organisation's cyber security objectives,
Assessing information security risks, analysing controls or designing new controls is linked to the ability to determine how the security implementation should work, as well as assessing the effectiveness of security controls at management, operational and technical levels and the competence to implement security controls.
The testing tasks included in the practice can be linked to the learning outcomes of the study programme in the application of security testing tools, knowledge of systems engineering and the principles of ethical hacking.
Knowledge of social engineering techniques allows better recognition of manipulations and

techniques that can lead to major security breaches in workplaces and to leaks of data, sensitive or commercial information. This practice is linked to the ability to implement, maintain and improve existing security mechanisms.

ViA has entered into cooperation agreements with industry companies and also received internship offers from public institutions. Within the framework of the study programme, successful cooperation has been established with leading companies in the industry, which are happy to offer internships for students; along with that, information received from companies (not necessarily from ViA cooperation partners) offering internships are published on the ViA website.

Since the students of the programme are already working in the IT industry, for the last three years they have chosen to do internship at their workplaces. Therefore, up to now there has been no need to offer an internship or provide support in finding it.

Should such a need arise, students would be offered internships at ViA cooperation partner institutions. As there is a pronounced shortage of cybersecurity specialists in the labour market, internship offers are also received from external organizations with which cooperation agreements have not been entered into. Accordingly, they would also be included in the offer of internships. This applies to both Latvian and international students.

During the reporting period, only one international student had to do an internship, the student did it at his current workplace – an international company with English as its working language. The Internship Regulations and tasks are available in Latvian and English.

Internship is defended before the internship defence commission, which is established by the Director of the programme. The commission is composed of the teaching staff of the programme – both professional lecturers and representatives of the academic staff of ViA. The internship supervisor evaluates student's performance during internship on a 10-point scale, namely, practical work skills and knowledge acquired by the student during internship; student's attitude towards the fulfilment of duties during internship. The overall assessment of internship consists of three components: assessment given by the internship supervisor (25%); internship report (50%); internship defence (25%).

Refer to the annex for the Internship Regulations for IT students (see Annex 61).

3.2.5. Evaluation and description of the promotion opportunities and the promotion process provided to the students of the doctoral study programme (if applicable).

3.2.6. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the marks of the final theses.

Upon applying for studies to the programme "Cybersecurity Engineering", potential students submitted a brief description of the potential topic of the Master's paper, specifying the relevance of the topic, the problem and the goal of the Master's paper. In this way, students were encouraged to think about the topic of the Master's paper and gather the necessary information during the

entire study period.

In 2021, the methodological instructions of the Faculty of Engineering "Guide for Preparation of Study Projects and Graduation Papers" were revised and updated. Methodological instructions contain general guidelines for writing the paper, they describe requirements for the State examinations and paper formatting, devoting a separate chapter to the topic of plagiarism. These instructions are a good support in the process of writing the paper. Methodological instructions are also translated into English.

The main purpose of the Master's paper is to demonstrate specific professional knowledge, skills and abilities related to the content of the study programme; to collect and analyze data, applying tools and methods specific to the study programme; to demonstrate the ability to generalize results obtained and to adapt them to solve similar problems; to demonstrate and approve student's practical experience and research skills.

During the reporting period (from 2020 to 2022), 11 Master's papers have been defended within the programme:

- Implementation of the Electronic Voting System in Latvia
- Adaptive Authentication for Web Applications
- Two Party Digital Signature Algorithm for Centralized User Authentication
- Dynamic Prevention of Cyber Attacks: Combined Types of Threats
- Study of Industrial Control System Network Cybersecurity and Design of Protection Prototype
- Factors Influencing the Organization of Secure Remote Working in the Public Sector in Latvia
- Improving Cybersecurity with Multiple Layers of Protection for an Enterprise with a Limited Budget
- Implementation of Information Systems Security Risk Analysis Methodology and Simplification Possibilities in Public Administration Systems
- Prospective Technologies for Sustainable and Secure Services
- **Industrial and Automation Control System Cyber Range Prototype for Offensive Capability Development**
- 5G Based Monitoring of Online Cash Register Systems

More than half, or 54%, of the graduation papers got top marks – "very good" (8), "excellent" (9), "outstanding" (10).

The paper "Industrial and Automation Control System Cyber Range Prototype for Offensive Capability Development" received the highest possible mark – outstanding (10). The results of the Master's paper were published at the international conference – *8th International Conference on Information Systems Security and Privacy*, presenting the article "*Industrial and Automation Control System Cyber Range Prototype for Offensive Capability Development".*

Relevance to industry

The range of the graduation paper topics covers specific aspects of cybersecurity resulting in practical recommendations or solutions such as "Solution for Preventing Dynamic Cyber Attacks in Cases of Combined Cybersecurity Attacks", the design of prototypes for network analysis and identification of cyber threats, as well as design of practical solutions, such as "Industrial and Automation Control System Cyber Range Prototype for Offensive Capability Development". Such a laboratory can be used for education and improvement of practical skills of automation and industrial control systems engineers, security personnel, and management. Besides, the skills

acquired while using the laboratory, from the point of view of offensive cybersecurity, can result in an increased awareness of current security problems and their prevention and increase security of the overall system.

The topics of the papers also cover a range of nationally relevant issues, such as “Design of Electronic Voting System Architecture” or “Development and Validation of Operating Concept of Online Cash Register System”, including a wide and at the same time deep set of knowledge, which can be used as a basis for developing such systems in Latvia.

uation papers include in-depth research of possible threats to IT infrastructure of companies, information security and management at a remote workplace, analysis of cybersecurity attack factors, threats and attack vectors, as well as analysis of various cybersecurity assessment methods and development of a methodology for analyzing security risks of information systems.

The grades of the graduation papers are stable, with a tendency to improve. If in the first year of graduation (2020) the average grade of the graduation papers was 7.1, then in the following years (2021, 2022) the average grade of the graduation papers was 8. This is related to a more careful selection of students in the entrance examinations and students’ own motivation. Besides, there are support systems in the process of writing graduation papers – the topic of the Master’s paper is submitted in the 3rd semester, followed by the first consultation with the supervisor and the development of the paper structure.

In order to improve the quality of the graduation papers, students must prepare two pre-defence reports reflecting the progress of the paper. Students present their reports before the pre-defence commission in the 4th semester. The pre-defence commission of the Master’s papers is established by the Director of the study programme and is represented by ViA’s academic staff, visiting lecturers, and industry professionals. In this way, supervision or control of the graduation paper progress is ensured, as well as possible improvements are suggested in a timely manner. As for students, pre-defence is like a reference point in the process of writing the paper, motivating them to regularly consult with the supervisor and promoting the process of writing the paper.

Additional support during the process of writing the graduation paper is provided by the “Self-check list” which is included in the revised methodological instructions of the Faculty of Engineering listing the most important stages of writing the graduation paper.

3.3. Resources and Provision of the Study Programme

3.3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples.

Resources available for the study programme (including financial resources), as well as material and technical provision enable the high-quality implementation of the study programme, they are adequate in relation to the content of the programme and allow successful organization of the study process.

There is a detailed list of resources available for the study field in Part II, section 2.3. of the report. Adding to the information stated there, it has to be pointed out that the e-environment where study course materials, course schedules, and other materials are uploaded is actively used in the study process. Furthermore, opportunities provided by the virtual learning environment are also used in the classes, for example, a self-prepared and configured digital investigation laboratory, where hacking and evidence consolidation training practices are provided in a closed environment. Remote lectures are given using platforms such as Teams, Skype or Zoom, while open source remote access platforms are used for practical demonstrations. In order to ensure learning outcomes of the study programme, students are supported by the Director of the study programme and the rest of the faculty staff.

3.3.2. Assessment of the study provision and scientific base support, including the resources provided within the framework of cooperation with other science institutes and higher education institutions (applicable to doctoral study programmes) (if applicable).

3.3.3. Indicate data on the available funding for the corresponding study programme, its funding sources and their use for the development of the study programme. Provide information on the costs per one student within this study programme, indicating the items included in the cost calculation and the percentage distribution of funding between the specified items. The minimum number of students in the study programme in order to ensure the profitability of the study programme (indicating separately the information on each language, type and form of the study programme implementation).

ViA does not divide infrastructure by study programmes, resources are assessed for the entire higher education institution as a whole. The base available for the implementation of the CI study programme (lecture-rooms, computer classes, laboratory, and library resources, computer software) is sufficient.

See Part II, Section 2.3., paragraphs 2.3.1. to 2.3.3. of the report for an extended list of available resources in the field of study.

3.4. Teaching Staff

3.4.1. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

During the reporting period, on average 15-19 lecturers were involved in the implementation of the study programme, in the academic year of 2021/2022 16 lecturers were involved in the implementation of the study programme – both academic staff elected by ViA, as well as invited visiting lecturers, industry professionals, industry experts. The programme is implemented by ViA academic staff and industry professionals; the proportion of ViA academic staff is 11% – all of them are holders of the Master's degrees or higher level degrees, while the proportion of industry professionals – practicing specialists, industry experts with higher education or professional certificates confirming qualification/experience (CISSP, CISA, CISM, CRISC, CEH, ISO/IEC 27002-2022) – is 89%; education and/or professional experience of the lecturers of the specialized courses correspond to the content of the study course. 37% of the lecturers of the programme are holders of a doctoral degree, while three of the lecturers are studying in a doctoral programme.

Qualifications of the teaching staff involved in the implementation of the study programme (2022/2023 academic years):

Professors	*Associate Professors*	*Guest Lecturers*
2	1	9
Visiting Professors	*Visiting Associate Professors*	*Visiting Assistant Professors*
1	1	5

In the academic year 2022/2023, 19 faculty members are involved in the implementation of the study programme. 53% or 10 of the teaching staff have doctoral degrees, of whom 30% are professors and visiting professors, 20% associate professors and visiting associate professors. 47% or 9 teaching staff have a Master's degree.
At the time of writing, the programme's teaching staff is dominated by persons with doctoral degrees.

Twelve lecturers have degrees in Computer Science or Information Technology - these lecturers teach specialised courses in the field; lecturers with degrees in Pedagogy, Business Administration, Economics and Social Sciences teach courses in the Management and Economics block. The education, qualifications and professional experience of the teaching staff are relevant to the courses they teach.

During the reporting period, experienced professionals/foreign guest lecturers from Estonia and the USA have also been involved in the implementation of the study programme - the knowledge, professional experience and methodology used by these lecturers are rated the highest in student surveys - the lecturers' practical work or professional experience, accumulated knowledge in the field of cyber security and willingness to share their experience are highly appreciated. The real examples of professional activity, discussions on current trends in the sector, especially in the context of cyber-attacks, the preparation of reports, the nuances of implementing cyber-security policy and the difficulties faced by the manager, as well as many other cases experienced in professional activity allow students to further strengthen the theoretical knowledge acquired in the study courses and to link theory with practice. Therefore, we can say that the involvement of industry professionals in the implementation of the study programme adds value to the

programme, while students are provided with a vision of the industry development trends, current trends, challenges and their possible solutions, in-demand skills and competences, allowing them to better prepare for the needs of the labour market.
The CVs of the lecturers annexed to the report contain detailed information on their professional qualifications and work experience in the sector.

During the reporting period, two of the programme graduates are also involved in the implementation of the content of the study programme.

The main criteria for the selection of lecturers are as follows: professional experience, education, and communication skills.

Lecturer's basic duties are as follows: preparation and oral implementation of study courses in accordance with the ViA schedule; promotion of students' discussion skills and independent thinking; examination of students' knowledge and skills acquired using various examination forms; conducting consultations; improving and supplementing the material and technical base; systematic performance of methodological work; continuous improvement of pedagogical and field-related scientific qualifications.

ViA has set measures to ensure and verify qualifications and competence of lecturers to provide high-quality education. They are as follows: 1) requirements are laid down in the ViA Regulations on Elections to Academic Positions; 2) ViA Remuneration Regulations contain the division of academic work, conditions for research work; 3) Student surveys for each study course taught by the lecturer in the relevant semester of the academic year; 4) ViA Senate has approved job descriptions and responsibilities of lecturers laying down requirements for academic work, research, academic and scientific qualification improvement, as well as requirements for administrative work; 5) In accordance with the Cabinet Regulations of the Republic of Latvia "Regarding Education and Professional Qualifications Necessary for Teachers and Procedure for Improving the Professional Competence of Teachers", professional development can include international mobility in accordance with the goals of professional development, participation in projects, conferences and seminars, which is confirmed by the documents issued.

3.4.2. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

Upon starting the programme, there were 19 lecturers involved in its implementation – 4 lecturers elected by ViA and 15 visiting lecturers. From the initially involved teaching staff, currently 8 lecturers continue their work in the programme – 3 elected lecturers and 5 visiting lecturers. Changes to the teaching staff have mostly affected the industry professionals or visiting lecturers. In most cases, the change of visiting lecturers has been related to the increasing workload in their main workplaces, which caused imbalance in the workload and resulted in the decision to terminate the employment relationship with the study programme. In two cases, lecturers were replaced based on the conclusions of the internal study programme audit and student complaints about the quality of work of visiting lecturers. Both mentioned cases were carefully assessed – discussions were held with the lecturers, student groups; as a result of the assessment, it was concluded that in the selection of teaching staff, despite the high professional qualifications, special attention should also be paid to communication and cooperation skills.

Therefore, when attracting new visiting lecturers to the programme, their professional experience

and possible contribution or investment of knowledge to the content of the programme, as well as communication skills, are assessed as a priority factor. The new visiting lecturers have introduced improvements to the programme, which are appreciated by students – for example, field trips to one of the largest companies in the industry and the opportunity to visit its Data Centre, meetings with the top manager of a company in the industry, examination of experience-based "case studies" during the study courses, acquiring specific tools/technologies or using specific software related to the specific study subject.

For the purposes of quality control, at the end of each semester, discussions are held with the students to find out their opinion on the quality of the study content and lecturer performance. As for visiting lecturers-industry professionals, student survey revealed that valuable theoretical and practical knowledge has been acquired during the course, the content of the course is presented in an interesting way, discussions and the exchange of opinions are encouraged, as well as students express their wish to listen to more lectures by specific visiting lecturers.

In general, students rate performance of the teaching staff within the semester from 4 to 5, where 5 is the highest rating.

Thus, the involvement of visiting lecturers/industry professionals in the implementation of the content of the study programme has provided expected results, and this is reflected in student feedback and course content evaluation.

3.4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals or peer-reviewed monographs may be additionally specified. Information on the teaching staff included in the database of experts of the Latvian Council of Science in the relevant field of science (total number, name of the lecturer, field of science in which the teaching staff has the status of an expert and expiration date of the Latvian Council of Science expert) (if applicable).

3.4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

3.4.5. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study programme and study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the

moment of the submission of the Self-Assessment Report).

Several activities are carried out within the study programme to foster cooperation between lecturers - one of them is the general faculty meeting, which is convened at the end of each semester and in which all programme lecturers - both elected and guest lecturers - are invited to participate. The main focus of the general meeting is to reflect on the semester and the current issues and challenges of the study programme. The Programme Director reports on current events, student performance, challenges in the programmes. During the General Assembly, participants are invited to give their views on both the processes and the promotion of mutual cooperation.
During the semester, programme lecturers have the opportunity to participate in course hospitalizations and evaluate the work of their colleagues, make recommendations for improving the study process, and share their experience. This opportunity is mainly used by the academic staff of the programme or the elected academic staff of VIA. In most cases, the professionals are familiar with each other in the context of the field and communicate directly.

Apart from the aforementioned, the Director of the study programme communicates with the teaching staff involved in the programme and informs them about the current events of the programme. Starting from 2022, a tradition has been introduced at the end of each semester to meet with all the lecturers of the particular semester to discuss good practice examples in the process of course implementation, discuss course assessments provided by students, as well as discuss challenges and find solutions to them through discussions.

At the time of preparation of the self-assessment report, the proportion of the number of students and teaching staff is 1:1.

Annexes

III - Description of the Study Programme - 3.1. Indicators Describing the Study Programme		
Sample of the diploma and its supplement to be issued for completing the study programme	34P_KI_Diploma-paraugs_Diploma-example-red.zip	34P_KI_Diploma-paraugs_Diploma-example-red.zip
For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions (if applicable)		
Compliance of the joint study programme with the provisions of the Law on Higher Education Institutions (table) (if applicable)		
Statistics on the students in the reporting period	2P-Studentu-statistika-2013-2022-AIKA-visi-StudentStatistics-corr.xlsx	2P-Studentu-statistika-2013-2022-AIKA-visi-StudentStatistics-corr.xlsx
III - Description of the Study Programme - 3.2. The Content of Studies and Implementation Thereof		
Compliance with the study programme with the State Education Standard	35P_KI_atbilstība valsts standartam_Compliance_LV_ENG-red-corr.docx	35P_KI_atbilstība valsts standartam_Compliance_LV_ENG-red-corr.docx
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard or the requirements for professional qualification (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	38P_KI kartejums_mapping- LV-ENG-red-corr.xls	38P_KI kartejums_mapping- LV-ENG-red-corr.xls
The curriculum of the study programme (for each type and form of the implementation of the study programme)	36P_KI-Studiju plans-Study-Plan_LV_ENG-red-corr.xlsx	36P_KI-Studiju plans-Study-Plan_LV_ENG-red-corr.xlsx
Descriptions of the study courses/ modules	37P_KI_Kursu-apraksti_Course-Descriptins.zip	37P_KI_Kursu-apraksti_Course-Descriptins.zip
Description of the organisation of the internship of the students (if applicable)	61P_Internship_IF_students_ENG.docx	61P_Prakšu_nolikums_IF_studentiem.docx
III - Description of the Study Programme - 3.4. Teaching Staff		
Confirmation that the academic staff of the doctoral study programme includes not less than five doctors, of which at least three are experts approved by the Latvian Council of Science in the branch or sub-branch of science in which the study programme intends to award a scientific degree (if applicable)		
Confirmation that the academic staff of the academic study programme complies with the requirements specified in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions (if applicable)		

Socio-technical systems engineering (51482)

Study field	*Information Technology, Computer Hardware, Electronics, Telecommunications, Computer Management, and Computer Science*
ProcedureStudyProgram.Name	*Socio-technical systems engineering*
Education classification code	*51482*
Type of the study programme	*Doctoral study programme*
Name of the study programme director	*Alvis*
Surname of the study programme director	*Sokolovs*
E-mail of the study programme director	*alvis.sokolovs@va.lv*
Title of the study programme director	*Dr.sc.ing.*
Phone of the study programme director	*29266503*
Goal of the study programme	*To promote the development of the electrical engineering, electronics, information and communication technologies sector and to create a competitive generation of young scientists of international level, capable of introducing the latest scientific knowledge in systems engineering into the national economy, improving the efficiency and safety of industry and the quality of products and services.*
Tasks of the study programme	*To prepare scientists in the field of systems analysis, modelling and design in the fields of electrical engineering, electronics, information and communication technologies and to promote the application of students' theoretical knowledge, cognitive and research skills and research results in such environments:* *- Business and Tourism Information Systems Modelling;* *- Systematic regional development planning;* *- modelling of political systems and social governance;* *- modelling of logistics information and transport systems;* *- modelling of production processes;* *- e-learning systems design;* *- Improvement of simulation modelling technology.*

Results of the study programme	*Knowledge:* *1. Knowledge of current information technologies;* *2. Knowledge of research methodologies and contemporary research methods in the field of information technology;* *Skills:* *3. Ability to independently evaluate and select appropriate methods for engineering research;* *4. the ability to independently improve and broaden own scientific qualifications;* *5. taking responsibility for the ethical aspects of their own research;* *6. the ability to communicate orally and in writing about the field of his/her research within the field of information technology and within the sub-field of systems analysis, modelling and design, to the wider scientific community and to society at large;* *Competences:* *7. To contribute to the development of information technology and to bring new understanding to existing knowledge as well as its application in practice by producing original research (thesis), some of which is at the level of internationally cited publications;* *8. the ability to carry out independent critical analysis, synthesis and evaluation, to solve significant research and innovative tasks;* *9. the ability to independently propose a research idea, plan, structure and manage scientific research projects, including international projects.*
Final examination upon the completion of the study programme	*Doctoral Thesis*

Study programme forms

Full time studies - 3 years - latvian

Study type and form	*Full time studies*
Duration in full years	*3*
Duration in month	*0*
Language	*latvian*
Amount (CP)	*120*
Admission requirements (in English)	*Master's degree in sociotechnical systems modelling or information technology or computer science or other natural or management sciences or equivalent higher education qualification with previous training in mathematical and/or simulation modelling*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Doctor of Science (Ph.D.) in Engineering and Technology*
Qualification to be obtained (in english)	*-*

Places of implementation

Place name	City	Address

Vidzeme University of Applied Sciences	VALMIERA	CĒSU IELA 4, VALMIERA, VALMIERAS NOVADS, LV-4201

Full time studies - 3 years - english

Study type and form	*Full time studies*
Duration in full years	*3*
Duration in month	*0*
Language	*english*
Amount (CP)	*120*
Admission requirements (in English)	*Master's degree in sociotechnical systems modelling or information technology or computer science or other natural or management sciences or equivalent higher education qualification with previous training in mathematical and/or simulation modelling; Level of English language proficiency at least at B2 level*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Doctor of Science (Ph.D.) in Engineering and Technology*
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Vidzeme University of Applied Sciences	VALMIERA	CĒSU IELA 4, VALMIERA, VALMIERAS NOVADS, LV-4201

3.1. Indicators Describing the Study Programme

3.1.1. Description and analysis of changes in the parameters of the study programme made since the issuance of the previous accreditation form of the study field or issuance of the study programme license, if the study programme is not included on the accreditation form of the study field, including changes planned within the evaluation procedure of the study field evaluation procedure.

Due to the accreditation process, in discussions with the colleagues of Vidzeme University of Applied Sciences Sociotechnical Systems Engineering Institute (SSII) and Rēzekne Academy of Technology, who are involved in the implementation of the study program, the name change of the study program was discussed. To expand opportunities and offer the program to graduates of business management, economics, and finance, and to cover a wider range of research directions, it is proposed to change the name of the study program from "Sociotechnical Systems Modelling" to "Sociotechnical Systems Engineering" (SSId). Experience shows that many sociotechnical system engineering specialists have experience in the IT industry (system analysis and design), but their previous degree is in management sciences or economics. The name change will also help to ensure better compliance of the study program with the research directions implemented in the Sociotechnical Systems Engineering Institute of the Vidzeme University of Applied Sciences. The name change of the study program was also approved at the Council meeting of the Engineering Faculty on December 8, 2022. In the following text, the study program is called Sociotechnical Systems Engineering.

The division of credit points between the mandatory courses, specific courses of the scientific sub-field and elective courses has been revised and changed. The division of credit points in the previous reporting period was as follows:

- Specific courses of the scientific sub-field (A): 7 CP
- Mandatory courses (A): 10 CP
- Elective courses (B): 3 CP

Currently, there is the following division of the credit points:

- Specific courses of the scientific sub-field (A): 8 CP
- Mandatory courses (A): 8 CP
- Elective courses (B): 4 CP

The total amount of theoretical study courses (20 CP) has not been changed.

In accordance with the recommendations of the previous accreditation, the goal and learning outcomes of the doctoral programme have been specified, as well as educational content has been supplemented with IT courses.

In accordance with the amendments to the Education Law and 27.09.2022. Regulations of the Cabinet of Ministers no. 595 Regulations on Latvian scientific branch groups, scientific branches and sub-branches - the name of the awarded degree is changed from "Doctor of Science degree (Ph.D.) in electrical engineering, electronics, information and communication technologies" to "*Doctor of Science (Ph.D.) in Engineering and Technology*".

3.1.2. Analysis and assessment of the study programme compliance with the study field. Analysis of the interrelation between the code of the study programme, the degree, professional qualification/professional qualification requirements or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements. Description of the duration and scope of the implementation of the study programme (including different options of the study programme implementation) and evaluation of its usefulness.

The goal of the doctoral programme "Socio-technical Systems Engineering" (SSId) is to promote the development of the electrical engineering, electronics, information and communication technology industry and to raise a new internationally competitive generation of scientists who are able to introduce the latest scientific findings of system engineering into the national economy, increasing the efficiency and reliability of the industry, as well as achieving production and service quality improvements.

The programme does not award a degree, however, it gives opportunities to write and defend a doctoral thesis in order to obtain a Ph.D degree in the field of engineering and technologies.

The main task of the doctoral programme is to prepare scientists in the field of engineering and technologies and to promote the application of students' theoretical knowledge, cognitive and research skills, as well as research results in the following environments:

- modelling of business and tourism information systems;
- systemic planning of regional development;
- modelling of the political system and public administration;
- modelling of logistics information systems and organisation of transport;
- modelling of production processes;
- design of e-learning systems;
- improvement of imitation modelling technology.

Learning outcomes of the doctoral programme are as follows:

1. Knowledge of the latest information technologies;
2. Managing and improving research methodology and modern research methods in the field of information technology;
3. Ability to independently evaluate and select appropriate methods for engineering research;
4. To contribute to the development of information technologies and to give new understanding to existing knowledge, as well as its application in practice by developing original research solutions (doctoral thesis), part of which is included in internationally cited publications;
5. Ability to perform independent critical analysis, synthesis and evaluation, to solve important research and innovative tasks;
6. Ability to independently propose a research idea, to plan, structure and supervise scientific research projects, int. al., international projects;
7. To assume responsibility for ethical aspects of research activity;
8. Ability to communicate orally and in writing about the area of research within the field of information technology and the sub-field of system analysis, modelling and design with wider scientific circles and society in general;
9. Ability to independently develop and improve one's own scientific qualification.

By fully completing the programme, doctoral students will acquire the following:

- modern research methods, as well as skills to apply them in their research;
- skills to prepare scientific publications, compile scientific reports, creatively solve theoretical and practical engineering issues in the field of information technology;
- skills to present their research and results at scientific conferences and seminars;
- They will also submit a doctoral thesis which is written in accordance with high scientific and technical standards.

The main differences compared to other doctoral programmes are as follows:

- The particular programme is an interdisciplinary programme, as it focuses mainly on sociotechnical systems engineering, namely, on a sub-field of information technology, respecting both technical and social aspects of the systems, in order to develop new system analysis and design methods, as well as new means of system modelling, which can be relevant to the computer science industry;
- A joint programme of Latvian universities of applied sciences, which provide a spectrum of research in all regions of Latvia and industrial sectors corresponding to the programme.

The reason for the implementation of the doctoral programme “Socio-technical Systems Engineering” is the problems specific to both Latvia and Europe, which are related to the limited interdisciplinary skills and cooperation opportunities of specialists and scientists. Industry specialists still have a typical tendency to use only problem-solving methods accepted in their field, abstracting from the methods used in other industries for solving similar issues. Specialists of technical sciences still consider social factors of systems as unimportant, but specialists of social sciences forget about the peculiarities of technical systems, as a result of which the goal of developing a management or administration system is not achieved. Secondly, there are tendencies to consider the application of the used mathematical apparatus as absolute, thus hindering an effective achievement of transparent solutions and their implementation in the national economy. Thirdly, solutions proposed are cumbersome, difficult to adapt, and it takes too much time to make changes to the existing solutions. Fourthly, there is a lack of abstraction at a sufficiently high level and compatible means of simulation modelling, which would be available and effectively applied to the national economy, public administration, and social sphere without in-depth mathematical knowledge and programming skills. Fifth, there are no single standards that can bring together different simulation technologies to develop widely available and distributed simulation modelling environments. The task of the doctoral students of the programme is to work on these issues.

Refer to the annex for the Sample of the diploma and its supplement to be issued for mastering the study program (see Annex 41).

3.1.3. Economic and/ or social substantiation of the study programme, analysis of graduates' employment.

Graduates of the doctoral programme have the opportunity to work not only as lecturers for the study field “Information Technologies” of Vidzeme University of Applied Sciences and/or as researchers for the Institute of Sociotechnical Systems Engineering, but also for any other higher education institution or institute that provides information technology studies and research, as well as for any higher education institution or training centre where a lecturer having knowledge and

skills in the field of information technologies and modelling is needed. After completing doctoral studies, graduates have possibilities to write and participate in a postdoctoral grant, as well as write and conduct other research projects. Wide employment opportunities are available within the framework of Horizon 2020 and Europe projects, both at Vidzeme University of Applied Sciences and also in industry companies, where the science and research component is one of the priorities. Due to globalization tendencies and exchange of workforce and experience, new doctors have also ample opportunities to engage professionally in a post-doctoral research project abroad, and such offers are made to both current and future graduates.

One of the graduates holds the following positions: a manager of scientific projects, a scientific assistant and the Chairman of Senate. The particular graduate participates also in projects such as – (1) Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Regions (E3UDRES2), a leader of work package 4 (I-Researchers) at Vidzeme University of Applied Sciences and a researcher at the sub-direction Human Contribution to Artificial Intelligence, (2) E3UDRES2 Entrepreneurship and Innovation Network for Smart and Sustainable European Regions (E.I.N.S), work package 4 researcher, (3) a leader of the project Cooperating for Excellence and Impact in Research & Innovation (Ent-r-e-novators) at Vidzeme University of Applied Sciences. Furthermore, another graduate has taken a childcare leave, but after her return, she plans to teach two study courses at Vidzeme University of Applied Sciences – Organizational Management and Digital Marketing.

3.1.4. Statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down into different study forms, types, and languages.

During the accreditation review period, the faculty professors and the study programme management have been actively and purposefully working on attracting new PhD students to the study programme. This has resulted in the number of existing PhD students and graduates. During the reporting period, the average number of students enrolled per year is 2, the average number of students in the programme - 6. In total 3 students have obtained the degree of Doctor of Science, successfully defending their doctoral theses. During the reporting period, studies were conducted only in Latvian.

Refer to the annex for student number dynamics during the assessment period (see Annex 2).

3.1.5. Substantiation of the development of the joint study programme and description and evaluation of the choice of partner universities, including information on the development and implementation of the joint study programme (if applicable).

The doctoral programme “Sociotechnical Systems Engineering” (SSId) has been developed in accordance with the Law on Higher Education Institutions of the Republic of Latvia, the Law on

Scientific Activities, and the Cabinet Regulations of the Republic of Latvia. The programme is practically implemented together with Rēzekne Academy of Technologies. As part of the study process, the following is jointly organized: seminars for doctoral students and exchange of academic staff (within study courses), as well as joint work in the promotion council.

The cooperation model between the two partner universities is based on common lines of research and study. The academic staff is complementary, which ensures inter-institutional knowledge flows. The choice of a partner university is therefore based on a common and complementary base of faculty and other resources. Cooperation has so far been informal, with agreements on topical issues related to the programme of study, but with accreditation an inter-university joint programme council is being introduced. The Council's role is to monitor and coordinate the activities necessary for the successful implementation of the programme, including the approval of the study plan for each academic year, agreement on student and faculty exchanges, jointly organised doctoral seminars and other relevant issues. The work of the Vidzeme University of Applied Sciences and Rezekne Academy of Technologies in Electrical Engineering, Electronics, Information and Communication Technologies Promotion Board is organised jointly. Equal representation of each university in the composition of the Promotion Board has been established, taking into account and respecting all established rules concerning the necessary representation of experts in the composition of the Board.

The purpose of the doctoral programme is to provide an opportunity for those students who have obtained a Master’s degree in Sociotechnical Systems Modelling or Information Technology, or Computer Science, as well as in other natural and engineering sciences (if they have learned mathematical and/or simulation modelling during their studies), to deepen their knowledge in system modelling and continue writing their doctoral thesis in accordance with the sub-field of science and the application environment.

The experience of the previous years shows that IT specialists with extensive experience in modelling and development of systems or cybersecurity solutions but with a previous degree in business or management sciences are willing to study in this programme, therefore the programme partner institutions consider it necessary to change the admission rules and, after obtaining accreditation, to admit to the PhD programme those who have a Master's degree in business or management sciences in addition to the already existing students. Accordingly, admission should be granted to holders of a *Master's degree in sociotechnical systems modelling or information technology or computer science, as well as in other natural sciences and management sciences, or equivalent higher education, if their previous education included mathematical and/or simulation modelling.*

The amount of the doctoral programme is determined in credit points (CP). The total amount of studies amounts to 120 CP, of which 20 CP are for theoretical classes (lectures, practical works, laboratory assignemnts and seminars), and 100 CP are for the writing of a doctoral thesis. Duration of doctoral studies – 3 years in the form of full-time studies. Study work is carried out in accordance with the individual study plan for each doctoral student, mainly working together with the scientific supervisor in scientific research projects.

Refer to the annex for the compliance of the joint study programme with the requirements of the Law on Higher Education (see Annex 42).

3.2. The Content of Studies and Implementation Thereof

3.2.1. Analysis of the content of the study programme. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators with the aims of the study course/ module and the aims and intended outcomes of the study programme. Assessment of the relevance of the content of the study courses/ modules and compliance with the needs of the relevant industry, labour market and with the trends in science on how and whether the content of the study courses/ modules is updated in line with the development trends of the relevant industry, labour market, and science.

The amount of the doctoral programme "Sociotechnical Systems Engineering" (SSMd) is determined in credit points (CP). The total amount of studies amounts to 120 CP, of which 20 CP are for theoretical classes (lectures, practical works, laboratory assignments and seminars), and 100 CP are for the writing of a doctoral thesis. Duration of doctoral studies – 3 years in the form of full-time studies. Study work is carried out in accordance with the individual study plan for each doctoral student.

- Theoretical courses: 20 CP
- Specific courses of the scientific sub-field (A): 8 CP
- Compulsory courses (A): 8 CP
- Elective courses (corresponding to the environment of the problem) (B): 4 CP
- Scientific-academic work: 100 CP
- TOTAL: 120 CP

The implementation of the course Sociotechnical Systems Requirements Engineering is the responsibility of ViA and the implementation of the course Business Information Systems Modelling is the responsibility of RTA. The remaining courses are implemented by mutual agreement at the Programme Board meeting in the current academic year according to the student population ratio in each higher education institution and the possibilities of involvement of specific teaching staff.

The study programme outcomes are aligned to meet the study programme objectives, and the course objectives and outcomes are interlinked with the study programme objectives and outcomes, based on a highly detailed mapping system between the overall study programme and the course objectives and outcomes of the study programme. The objectives and outcomes of the relevant courses are adapted on the basis of the overarching objectives and outcomes of the programme. The alignment of the overall course outcomes with the programme outcomes can be seen in the programme mapping.

The content of the courses is developed in line with the latest trends in the industry and the development trends in the field of Electrical Engineering, Electronics, Information and Communication Technologies, taking into account the research and academic experience of the professors of both universities in the field.

The novelty of the programme is the course "GIS Integrated Solutions". Furthermore, subtopics offered within the specific course of modelling are improved. The scientific-academic work is part of the doctoral programme, for the purpose of which students develop the following skills:

- Independent analysis of a scientific problem and determination of ways for its solution;
- Application of research methodology and modern data processing technologies;
- Acquisition of new scientific knowledge to promote contribution of the sub-field to the problem solving process;
- Implementation of the proposed scientific solutions in the national economy, both on an

international and national scale;
- Understanding of cross-sectoral issues, ability to generalize and adapt work results;
- Ability to work on international projects and in international teams;
- Skills for the writing of a doctoral thesis.

Students acquire the ability to analyze various systems (environmental protection, tourism, business processes, computer networks, telecommunications, politics, public relations, etc.) with the help of simulation modelling, to analyze processes, to model and visualize them in an electronic environment as closely as possible to real life, and this skill allows them to predict the development of various processes as accurately as possible in the future.

Refer to the annex for Study program plan (see Annex 43).

Refer to the annex for Descriptions of study courses of the study program (see Annex 44).

Refer to the annex for Mapping of study courses to achieve the study results of the study program (see Annex 45).

3.2.2. In the case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation. In the case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels (if applicable).

The programme provides an opportunity to write and defend a doctoral thesis in order to obtain a PhD degree in engineering and technologies. The main task of the doctoral programme is to prepare scientists in the field of engineering and technologies and to promote the application of students' theoretical knowledge, cognitive and research skills, as well as research results.

The promotion council of the programme "Sociotechnical Systems Modelling", upon making a decision, evaluates whether research has been conducted independently and provides new scientific findings in the field of engineering and technologies, as well as whether research results published/accepted for publication in scientific publications that are anonymously reviewed are internationally available in repositories of scientific information and whether several are included in SCOPUS/Web of Science; whether scientific results of the doctoral thesis have been reported in at least 3 international congresses, conferences or symposia; whether the applicant has participated in the implementation of scientific projects; or whether research is conducted in cooperation with foreign scientific institutions, other Latvian scientific institutions or companies.

The programme strengthens existing research strands in the Faculty's affiliated research institute and builds a new generation of academic and scientific staff. PhD students are an important part of the Institute and its research projects. Often the projects require the participation of doctoral students, and as far as possible, thought is given to linking the topics of doctoral theses with research projects. The Institute of Sociotechnical Systems Engineering of Vidzeme University of Applied Sciences implements the following research directions:

- Virtual reality technologies and visualization;
- Sociotechnical systems modelling technologies and security;
- E-study management and technologies;

- Smart technologies and eco-buildings in the national economy.

The programme also has a positive impact on the field of study as a whole. Some of the PhD students are also on the faculty of another study programme in their field of study. Therefore, the experience and research expertise of these faculty members will contribute positively to the overall quality of the study programmes. At the time of submission of the self-assessment report, 5 of the faculty members from other study programmes in the field of study are studying in the programme.

3.2.3. Assessment of the study programme including the study course/ module implementation methods by indicating what the methods are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. In the case of a joint study programme, or in case the study programme is implemented in a foreign language or in the form of distance learning, describe in detail the methods used to deliver such a study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

The main task of the doctoral programme is to prepare scientists in the sub-field of system analysis, modelling and design of electrical engineering, electronics, information and communication technologies and to promote the application of students' theoretical knowledge, cognitive and research skills, as well as research results in the following problem environments:

- Modelling of business and tourism information systems;
- Systematic planning of regional development;
- Modelling of the political system and public administration;
- Modelling of logistics information systems and organisation of transport;
- Modelling of production processes;
- Design of e-learning systems;
- Improvement of simulation modelling technologies;
- Application of simulation modelling methods for agricultural policy making and sustainability analysis;
- Analysis of cyber security system sustainability and the development and approbation of methods for assessing system security;
- Interdisciplinary research, the use of intelligent systems methods in design of buildings and energy efficiency assessment.

Doctoral students of the programme conduct research, which determines the division of studies between the theoretical part (20 CP) and scientific-academic work (100 CP). Full-time study work is carried out in accordance with an individual plan, which allows respecting scientific research activities of each doctoral student in accordance with the problem environment. The individual plan is approved by the thesis supervisor, the doctoral student and the Director of the programme. The study plan execution control is carried out by the Director of the doctoral programme (quantitative control) and by the scientific supervisor of the doctoral thesis (quality control).

The forms of theoretical classes are as follows: lectures, practical works, laboratory demonstrations and seminars. Theoretical classes can be conducted as face-to-face classes, as well as by using electronic means of telecommunications. There are also courses that develop student leadership skills and use active learning methods, where the lecturer often has a role of a mentor. The lecturer encourages students to create their own vision in the development of publications and learn from

their mistakes. Different ways of preparing report papers are offered depending on the learning style of the students. Likewise, topics of the independent work carried out during the study courses are adapted to the topic of the student's doctoral thesis, within the limits of possibilities and in accordance with the course plan, thus promoting a student-centred educational process and contributing to the achievement of the study programme's objectives and outcomes.

Within the framework of academic work, students prepare and supervise practical and laboratory demonstrations for Bachelor's and Master's programmes, while within the framework of scientific work they write their doctoral theses and participate in research projects. Doctoral students carry out scientific work in close communication with the thesis supervisor. The annual number of peer-reviewed international publications included in international databases is used as a quantitative criterion.

ViA ensures the implementation of the Programmes in such a way that the principles of student-centred education are taken into account in the implementation of the study process and students are encouraged to actively participate in the shaping of the study process. ViA respects the diversity of students' needs in the study process by choosing learning methods that suit them. ViA uses innovative pedagogical methods and an individual approach. Study programme directors ensure that lecturers involved in the implementation of the programme are familiar with the methods of assessing learning outcomes and are supported in developing their skills in this area; assessment criteria and methods, as well as the criteria for grading, are made public in advance; assessment provides students with the opportunity to demonstrate the extent to which they have achieved the learning outcomes; students receive feedback from lecturers who, where appropriate, provide advice on the study and research process; assessment is consistent, applied fairly to all students and implemented in accordance with the approved course descriptions. Appropriate procedures are in place to deal with student complaints, which are regulated by the Regulations on Studies and the Regulations on Ethics.

3.2.4. If the study programme envisages an internship, describe the internship opportunities offered to students, provision and work organization, including whether the higher education institution/ college helps students to find an internship place. If the study programme is implemented in a foreign language, provide information on how internship opportunities are provided in a foreign language, including for foreign students. To provide analysis and evaluation of the connection of the tasks set for students during the internship included in the study programme with the learning outcomes of the study programme (if applicable).

3.2.5. Evaluation and description of the promotion opportunities and the promotion process provided to the students of the doctoral study programme (if applicable).

The Cabinet of Ministers of the Republic of Latvia has delegated VIA the right to award the doctoral degree in "Electrical engineering, electronics, information and communication technologies" by amending the Cabinet Regulations No. 1000 "Regulations regarding the Delegation of the Right to

Award Doctoral Degrees (Promotion) to Higher Education Institutions" of 27 December 2005. Graduates of theoretical courses of the study programme and candidates for doctoral degree have the right to submit their thesis for evaluation to the Promotion Council of Electrical Engineering, Electronics, Information and Communication Technologies of Vidzeme University of Applied Sciences and Rezekne Academy of Technologies.

The doctoral degree is awarded for an independently written and publicly defended doctoral thesis which contains results of original scientific research and provides new findings in the relevant discipline of science. The following person is entitled to defend his or her doctoral thesis: an applicant for a scientific degree who has successfully completed the academic part of the accredited doctoral programme "Socio-technical Systems Modelling" or "Information Technologies" and has prepared a doctoral thesis for defence, or whose academic activity performed outside this programme is equal to it in accordance with the procedure provided for in the Regulations of Promotion Council of Sociotechnical Systems Modelling (SSM) and in accordance with the criteria set by the Cabinet, and who has successfully passed the examinations of the doctoral programme "Socio-technical Systems Modelling".

Before submitting a thesis to the secretariat of the SSM Promotion Council, it is reviewed by the structural unit where the thesis was written. If necessary, the thesis is initially reviewed by at least one lecturer who is a holder of a doctoral degree and who is selected by the structural unit and who has the right of an expert of the Latvian Council of Science in the field of "Engineering and technologies: Electrical engineering, electronics, information and communication technologies". The thesis afterwards is discussed in an open meeting of the structural unit. Once the relevant structural unit recommends the thesis for submission to the Promotion Council, the thesis may be submitted to the Promotion Council. The Promotion Council evaluates the thesis in accordance with the procedure established in the Regulations of the Promotion Council and Cabinet Regulations No. 1001 "Procedure and Criteria for Awarding (promotion) of Doctoral Degree". Upon successful defence of the thesis, the Ph.D. candidate receives a Doctor of Science (Ph.D) degree in engineering and technology.

The Promotion Council of SSM, in accordance with the requirements laid down in the Council Regulations and the Cabinet Regulations No. 1001, upon taking a decision, evaluates the following: whether research has been conducted independently and provides new scientific findings, whether research results published/accepted for publication in scientific publications that are anonymously reviewed are internationally available in the scientific information repositories and whether several of them are included in SCOPUS/Web of Science, whether the applicant has passed the doctoral examinations provided for in the doctoral programme, whether scientific results of the doctoral thesis have been reported in at least 3 international congresses, conferences or symposia, whether the applicant has supervised Bachelor's or Master's papers, whether he or she has given lectures or conducted seminars at a higher education institution in the amount of at least one credit point, whether the applicant has participated in the implementation of scientific projects, or conducted research in cooperation with foreign scientific institutions, other Latvian scientific institutions or companies.

3.2.6. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the marks of the final theses.

In 2019, one graduate of Vidzeme University of Applied Sciences defended his doctoral thesis within the study programme at the Promotion Council of Electrical Engineering, Electronics, Information and Communication Technologies of Vidzeme University of Applied Sciences and Rezekne Academy of Technologies. The topic of the doctoral thesis was “Integrated Technology Acceptance and Sustainability Evaluation Model”. The doctoral thesis is dedicated to the development of a model for the integrated technology acceptance and sustainability evaluation – with the growing range of different sociotechnical systems and the pace of development of technological innovations, there was a need for methods and tools by the help of which decision-makers could evaluate new technologies and their potential acceptance and sustainability. As a result of the thesis, an integrated technology acceptance and sustainability evaluation methodology was created. The working versions of the methodology were applied and validated in the grant projects “Large Scale Choreographies for the Future Internet”, “Future Policy Modelling” of the 7th Framework Programme of the European Commission, as well as in the FLAG-ERA project “Large Scale Experiments and Simulations for the Second Generation of Future ICT” of the European Commission.

In 2022, two doctoral theses written within the study programme of Vidzeme University of Applied Sciences were defended before the joint Promotion Council.

One topic of the doctoral thesis was – “Technological Solution for Communication in Remote Work Environment to Promote Motivation and Satisfaction”. The goal of research was to develop a technological solution for effective communication in the work environment, taking into account user motivation and satisfaction. By applying company modelling methods, a model has been developed that includes goals, capabilities and context elements for a secure and effective communication system for working remotely. Using the 4EM method, the factors involved and the quantities to be measured were described. To measure the level of motivation and satisfaction, an algorithm has been developed using machine learning, enabling not only to determine the current level of motivation, but also to predict the desire of employees to stay with the organization or leave it. The purpose of this technological system is to facilitate a motivating online work environment (i.e., remote work).

The doctoral thesis was approbated, and the graduate participated in the following projects during the process of writing her doctoral thesis: 1. “Development of Academic Staff and Human Resources of Vidzeme University of Applied Sciences”, project No. 8.2.2.0/18/A/012 “Growth and employment” of the specific support goal 8.2.2 “To strengthen academic staff of higher education institutions in the areas of strategic specialization” (06.09.2019-05.09.2020); 2. National research programme “Covid-19 mitigation” No. VPP-COVID-2020/1-0009 “ARTSS – Advanced Resilience Technologies for Secure Service” (07.09.2020-20.12.2020).

The second topic of the doctoral thesis written in 2022 was – “Application of Simulation Modelling and Sensor System for Ecosystem Management”. This is an interdisciplinary doctoral thesis, the author of which during its writing has applied not only his knowledge in electrical engineering, electronics, and information and communication technologies, but also additionally acquired knowledge in biology, geology, hydrology, hydraulics and meteorology. The thesis describes the design of a sensor system for obtaining raw data for the purposes of simulation modelling, data processing and the design of BogSim, a simulation model of bog hydrological systems, which is the basis for the design of a sensor system, because the sensor system deals with the availability of quality input data for the needs of ecosystem simulation models. The ecosystem modelled in the doctoral thesis is the hydrological system of a bog, because an adequate groundwater level is the main prerequisite for the restoration of the sensitive flora and fauna typical of the ecosystem in the degraded raised bog.

The methodologies developed as part of thesis are applied in the internal research project “Multi-

Sensor Monitoring for Smart and Sustainable Farming in Europe (MULTISENS^{2}E)" (01.10.2021 - 30.09.2023) of the European universities project "Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Regions (E3UDRES2)" (project No. 101004069, 01.10.2020 - 30.09.2023) of the European Union programme "Erasmus+", in the research project of the Fundamental and Applied Research Project Programme "Visualization of Real-Time Bog Hydrological Regime and Simulation Data in Virtual Reality" (No. lzp -2020/2-0396, 01.12.2020 – 31.12.2021) and in the scientific research project "reSilienT fARminG by Adaptive microclimaTe managEment (STARGATE)" of the research and innovation support program "Horizon 2020" of the European Union (No. 818187, 01.10.2019 - 30.09.2023).

The following criteria are evaluated when submitting a doctoral thesis to the Promotion Board:

- the author of the thesis has justified the choice of the topic, defined the aim and objectives of the research;
- has described the scientific achievements in the study of the topic;
- has used appropriate, modern (qualitative and quantitative) research methods;
- has sufficiently interpreted the results and insights obtained in the thesis and has accurately formulated the new scientific knowledge gained and reflected it in the conclusions;
- has demonstrated that the thesis is a complete original study, the results of which are relevant to the field/sub-field of science concerned, or the scope and content of the thesis are appropriate to the level of the thesis and the results of the thesis are authentic;
- the results of the thesis have been published in scientific journals or monographs included in SCOPUS/Web of Science;
- the results of the research have been published in international scientific conferences or congresses.

3.3. Resources and Provision of the Study Programme

3.3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples.

Resources (including financial resources) and material and technical provision available for the programme enable high-quality implementation of the programme and are adequate in relation to the content of the programme, as well as they allow successful organization of the study process. The existing material and technical support, such as computer equipment, laboratory equipment, computer programs, databases, helps doctoral students to learn and improve their technical and research skills in a practical way, to carry out their thesis research, and is sufficient to achieve the defined programme learning outcomes.

Part II, Section 2.3., paragraphs 2.3.1. to 2.3.3. of the report already provides a detailed list of resources available for the study field. In addition to what was mentioned there, doctoral students are actively involved in various research projects during the study process, thus, they obtain very good experience in the implementation of research projects.

All resources are available to all students, there are no separate resources available only to PhD students. Doctoral students are provided with the necessary databases to carry out their research and theses. For a list of available databases, see Section 2.3.3. Specific information and additional resources are provided upon individual request at the SSII institute and/or faculty, e.g. a professional version of the simulation modelling tool Stella was purchased with project funds at the request of a PhD student. PhD students are also involved in research projects at the Institute where possible. For specific examples of projects involving doctoral students, see Section 2.4.5.

In accordance with the themes of the PhD students' thesis, for research purposes, and if necessary and by prior agreement, VIA and RTA are ready to cooperate in the sharing of material and technical equipment. Thus, doctoral students have access not only to the facilities available at ViA, but also to those at RTA, which are fully sufficient to carry out their thesis research.

3.3.2. Assessment of the study provision and scientific base support, including the resources provided within the framework of cooperation with other science institutes and higher education institutions (applicable to doctoral study programmes) (if applicable).

According to the nature of the joint programme, resources and provision of two higher education institutions are combined to implement the programme, including scientific capacity of the staff, as well as scientific and technical base.

Mobility of staff and students is ensured during the implementation of the study programme. The study plan for each academic year is agreed in a joint study programme board, which means that if the course is implemented in the other partner university, it provides all the necessary material and technical support for the implementation of the course. In addition, as regards the supervision of doctoral theses, if the doctoral student needs assistance in choosing a supervisor, the joint scientific capacity of the staff of the two universities is also taken into account in this case. And, accordingly, if, in the course of the doctoral thesis, the doctoral candidate would benefit from working in one of the laboratories of the other university, the partner universities will share their material and technical facilities. The CAD/ CAE/ CAM laboratory, Physics laboratory, Electronics laboratory, Chemistry laboratory, Ecology laboratory, Mechatronics laboratory, Hydraulics laboratory of Rezekne Academy of Technologies are also available for the PhD students of Vidzeme University of Applied Sciences.

3.3.3. Indicate data on the available funding for the corresponding study programme, its funding sources and their use for the development of the study programme. Provide information on the costs per one student within this study programme, indicating the items included in the cost calculation and the percentage distribution of funding between the specified items. The minimum number of students in the study programme in order to ensure the profitability of the study programme (indicating separately the information on each language, type and form of the study programme implementation).

ViA netiek nodalīta infrastruktūra pa studiju programmām, bet resursi novērtēti visai augstskolai kopumā. SSI studiju programmas īstenošanai pieejamā bāze (auditorijas, datorauditorijas, laboratorija, bibliotēkas resursi, datorprogrammas) ir pietiekama.

See Part II, Section 2.3., paragraphs 2.3.1. to 2.3.3. of the report for an extended list of available resources in the field of study.

3.4. Teaching Staff

3.4.1. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

Teaching staff of ViA and Rēzekne Academy of Technologies are involved in the implementation of the programme. Since representatives from partner universities in Poland, Spain, Germany, and Lithuania also participated in the development of the programme, there is a possibility to invite teaching staff of these partner universities within the framework of the Modelling course.

Renewal of the academic and scientific staff involved in the doctoral programme and improving of its quality is related to the participation of partners and, especially, foreign universities in the programme, thus promoting an analogical understanding of quality assessment, opportunities for mutual recognition of formal assessments, joint academic and scientific work, as well as an increase in the number of cooperation projects, creating the basis for the growth of young scientists.

The academic staff of the academic programme meets the requirements specified in Clause Three of Paragraph One of Section 55 of the Law of Higher Education Institutions – not less than five professors and associate professors altogether who are elected to academic positions in the relevant higher education institution take part in the implementation of the compulsory part and the limited elective part of academic study programmes.

The elected academic staff of the joint doctoral programme (Vidzeme University of Applied Sciences and Rēzekne Academy of Technologies) consists of six elected professors and associate professors –

1. Prof. P. Grabusts (RAT)
2. Assoc. Prof. Sergejs Kodors (RAT)
3. Prof. Artis Teilans (RAT)
4. Assoc. Prof. Lienīte Litavniece (RAT)
5. Assoc. Prof. Arnis Cīrulis (ViA)
6. Assoc. Prof. Kaspars Osis (ViA)
7. Prof. S. Cakula (ViA)

Out of the total 14 faculty members involved in the study programme, 5 are from RTA (Doc. Mārīte Opincāne, Prof. P. Grabusts, Asoc.prof. Lienīte Litavniece, Prof. Artis Teilāns, Asoc.prof. Sergejs Kodors) and 4 from VIA (Asoc.prof. Arnis Cīrulis, Asoc.prof. Kaspars Osis, Senior Researcher, Visiting Assoc. Prof. G. Majore, Prof. S. Cakula). As far as possible, international faculty members are involved in the study programme, for example, at the moment, Visiting Assistant Professor Michal

Kepka (University of West Bohemia, Czech Republic) is involved in the study programme. The involvement of international faculty is based on inter-university project cooperation as well as strategic partnerships of the university, thus strengthening the programme and providing students with the opportunity to gain a broader perspective on a given topic.

The qualifications of the teaching staff are indicated both by the scientific publications referred to in point 3.4.3 and in the Annex and by the scientific projects or project work packages led by the teaching staff referred to in point 3.4.4. ViA has established measures to verify and check that lecturers working with students have the necessary qualifications and competences, i.e:

- The requirements are laid down in the ViA Regulations on the Election to Academic Positions;
- The ViA Regulation on Remuneration contains the distribution of academic work, conditions for research work;
- The Senate of VIA has approved the content and duties of lecturers' work, which define the requirements for academic work, research, academic and scientific qualification and administrative work;
- In accordance with the Regulation of the Cabinet of Ministers of the Republic of Lithuania "On the education and professional qualifications required for teachers and the procedure for the development of professional competence of teachers", professional development may include international mobility, participation in projects and participation in conferences and seminars, as evidenced by the documents issued for professional development.

Taking into account the normative acts developed by ViA, the teaching staff involved in the implementation of study programmes have appropriate qualifications to participate in the implementation of the programme and to achieve the aims and objectives of the study programme, study outcomes, and meet all the requirements of the normative acts. The CVs of the lecturers attached to the report contain detailed information on their professional qualifications - lecturers' work experience in the field and the information they have on current developments in the field are included in the study courses.

3.4.2. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

Some of the leading lecturers of the study programme have not changed. Some of the lecturers have increased their competence by obtaining a doctoral degree or have been promoted from associate professor to professor. Also, during the reporting period, new lecturers have been attracted, further strengthening the competence of the teaching staff in this field. The next two points – namely, scientific publications of the teaching staff and their participation in research projects during the reporting period – reveal the competence of the teaching staff in this field.

Since the previous accreditation, the overall scientific and academic qualifications of the two partner universities in the field have increased, as can be seen in the two chapters below and in the annexes with the CVs of the lecturers. Consequently, much more local teaching staff are involved in the implementation of the study programme. For example, during the reporting period, relatively recent PhD holders have been recruited, such as: senior researcher, visiting assistant professor Ginta Majore, assistant prof. Arnis Cīrulis, Asoc.prof. Prof. Arūnas Cīrulis, Associate prof. Sergejs Kodors, which is a valuable asset for the development of the new generation of scientists of both

partner universities. Also, faculty members from international cooperation universities have been attracted, such as Visiting Assoc. Michal Kepka from the University of West Bohemia in the Czech Republic, which is also an important factor in broadening the common horizons of PhD students.

3.4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals or peer-reviewed monographs may be additionally specified. Information on the teaching staff included in the database of experts of the Latvian Council of Science in the relevant field of science (total number, name of the lecturer, field of science in which the teaching staff has the status of an expert and expiration date of the Latvian Council of Science expert) (if applicable).

The elected academic staff of the joint doctoral programme (Vidzeme University of Applied Sciences and Rēzekne Academy of Technologies) consists of eight professors –

1. Assistant Professor Mārīte Opincāne (RAT)
2. P. Grabusts (RAT)
3. Prof. Lienīte Litavniece (RAT)
4. Artis Teilāns (RAT)
5. Prof. Sergejs Kodors (RAT)
6. Prof. Arnis Cīrulis (RAT)
7. Prof. Kaspars Osis (ViA)
8. Leading researcher, visiting assistant professor G. Majore (ViA)
9. S. Cakula (ViA)

Of which four are experts approved by the Latvian Council of Science in the relevant field of science in which the programme awards a scientific degree –

1. Prof. S. Cakula (31.03.2024, Engineering and Technology - Electrical Engineering, Electronics, Information and Communication Engineering),

2. Prof. P. Grabusts (05.10.2025, Engineering and Technology - Electrical Engineering, Electronic Engineering, Information and Communication Engineering),
3. Asoc.Prof. Sergejs Kodors (06.10.2024, Engineering and Technology - Electrical Engineering, Electronics, Information and Communication Engineering),
4. Asoc.Prof. Arnis Cīrulis (01.12.2024, Engineering and Technology - Electrical Engineering, Electronics, Information and Communication Engineering).

In addition to that, the following doctors who are not part of the elected academic staff of Vidzeme University of Applied Science or Rēzekne Academy of Technologies are involved into the programme –

1. Visiting Prof. Jānis Grundspeņķis (RTU)
2. Visiting Prof. Egils Ginters (RTU)
3. Visiting Assistant Professor Vita Šakele (RTU)
4. Visiting lecturer Michal Kepka (University of West Bohemia, the Czech Republic)

Two of whom are experts approved by the Latvian Council of Science in the relevant field of science in which the programme awards a scientific degree –

1. Guest prof. Jānis Grundspeņķis (07.09.2025, Engineering and Technology - Electrical Engineering, Electronics, Information and Communication Engineering),
2. Guest prof. Egils Ginters (31.03.2024, Engineering and Technology - Electrical Engineering, Electronics, Information and Communication Engineering).

The number of scientific publications of the academic staff involved in the implementation of the doctoral programme during the reporting period –

1. S. Cakula - 32
2. P. Grabusts - 26
3. Prof. Lienīte Litavniece - 19
4. Artis Teilāns - 11
5. Prof. Sergejs Kodors - 15
6. Prof. Arnis Cīrulis - 9
7. Pprof. Kaspars Osis - 3
8. Visiting lecturer Michal Kepka – 13
9. Leading researcher, visiting Assistant Professor G. Majore - 11
10. Visiting Prof. Jānis Grundspeņķis - 22
11. Visiting Prof. Egils Ginters - 53

The list of scientific publications of the review period created by the academic staff involved in the implementation of the doctoral study program can be found in the additional appendices (PAPILDUS_PIEL_Publikācijas_Doktorantura_SSMd_LV_ENG.docx).

Refer to the list of scientific publications of the academic staff involved in SSId during the reporting period (see Annex 46).

3.4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

Ginta Majore

2019 – 2023 Project “reSilienT fARminG by Adaptive microcimaTe managEment -STARGATE”, Total project budget: EUR 6 994 405.00, Project is financed by the European Commission.

2021 – 2023 Advances: increasing cyber security capabilities of society. Grant: Total budget of the European Project: EUR 999130.07 Project is financed by the Baltic Research Programme of the Financial Instrument of the European Economic Area.

2022 – 2025 Project “Twinning in Environmental Data and Dynamical Systems Modelling for Latvia” (TED4LAT) Total project budget: EUR 1120000.00 Project is financed by the European Commission.

2020 – National research programme “Covid-19 mitigation”, “Advanced Resilience Technologies for Secure Service (ARTSS)”. Development of virtual reality content and integration of functionality in

e-study platforms. Total project budget: EUR 497500.00. Project is financed by the Latvian Council of Science.

2014 – Research project grant “Design of a Simulation Model and Software Prototype for Assessing the Use and Sustainability of Natural Resources in Households in the Area of Protected Landscapes”. Total project budget: EUR 10000. Project is financed by Valmiera City Local Government.

2016 – Research project grant “Design of a Prototype of Simulation Model and Platform-compatible Software for Long-Term Analysis and Monitoring of Energy Resource Consumption by Municipal Facilities”. Total project budget: EUR 10000. Project is financed by Valmiera City Local Government.

2021-2023 – To strengthen academic staff of higher education institutions in the areas of strategic specialization in RAT, VeA and ViA. Total project budget: EUR 408 852. Project is financed by the European Social Fund.

Arnis Cīrulis

2021 - 2022 – Scientific supervisor of the project “Virtual Reality Platform for Safety Training of Construction Workers”, LIAA (KC-PI-2020/64). Total project budget: EUR 299821.50. Project is financed by the Investment and Development Agency of Latvia.

2021 – Scientific supervisor of the project “Visualization of Real-Time Bog Hydrological Regime and Simulation Data in Virtual Reality (BogSim-VR)”, Latvian Council of Science (No. lzp-2020/2-0396). Total project budget: EUR 100389.00. Project is financed by the Latvian Council of Science.

2017-2019 – Post-doc grant project No. 1.1.1.2/VIAA/1/16/105 of the State Education Development Agency “Dynamic 3D Visualization of the Internet of Things Elements in Outdoor Augmented Reality Modes”. Total project budget: EUR 133415.09. Project is financed by the State Education Development Agency.

2016-2017 – author and supervisor of the research grant project “Prototype of the Online Augmented Reality System for 3D Animated Models” financed by Valmiera city local government. Total project budget: EUR 10000. Project is financed by Valmiera City Local Government.

2015-2016 – Erasmus Mundus Action 2; MID Mobilities for Innovation and Development, University of Turku, Finland. Reserch topic “Visualization and virtualization of simulation modelling data for various economics domains”. Grant agreement 2012-2742/001-001-EMA2 939/25/2012. Project budget: EUR 15000. Project is financed by the European Commission.

2014-2015 – author and supervisor of the research project grant “Designing an Interactive Three-Dimensional Environment for Learning Anatomy from Computed Tomography Images” financed by Valmiera city local government. Total project budget: EUR 10000. Project is financed by Valmiera City Local Government.

2013-2014 – author and supervisor of the research project grant “Visualization of Virtual Buildings in Real Space for Urban Planning (City 3D-AR)” financed by Valmiera city local government. Total project budget: EUR 10000. Project is financed by Valmiera City Local Government.

Kaspars Osis

2015–2016, author and supervisor of the research project grant “Development of Guidelines for Lifelong Education 2016-2020 in Vidzeme region and Design of Technological Solution Prototype”

financed by Valmiera city local government. Total project budget: EUR 10000. Project is financed by Valmiera City Local Government.

Michal Kepka

AFarCloud - Aggregate Farming in the Cloud. 2018-2021. ECSEL Joint Undertaking. Total project budget: EUR 26 568 727.39. Team leader of project partner. Project is financed by the European Commission.

SmartAgriHubs - Connecting the dots to unleash the innovation potential for digital transformation of the European agri-food sector. 2018-2022. H2020-EU.3.2.1.3. Team leader of project partner, Innovation Experiment technical management. Total project budget: EUR 22 400 850.78. Project is financed by the European Commission.

PoliRural - Future Oriented Collaborative Policy Development for Rural Areas and People. 2019-2022.H2020-RUR-2018-2. Team leader of project partner. Total project budget: EUR 5 999 875.28. Project is financed by the European Commission.

Sieusoil - Sino-EU Soil Observatory for intelligent Land Use Management. 2019-2022.H2020-SFS-2018-2. Team leader of project partner. Total project budget: EUR 6 875 350. Project is financed by the European Commission.

Peregrinus Silva Bohemica - Multimediální a digitální turistický průvodce pro přeshraniční historické cesty v Bavorském lese a na Šumavě. 2016 – 2019. Evropská komise-Strukturální fondy, projekt č. 60. Technical management. Total project budget: EUR 1 315 053.96. Project is financed by the European Commission.

Artis Teilāns

2016.-2017. State Land Administration and Rezekne Academy of Technologies Contract “IT expertise for Remote data sensing for State Land administration cadastres”. Contract Nr. 7.6.3/76-2016. Project Manager;

2014 -2015 Lattelecom and Rēzekne Academy of Technology contract work “IT pētījumi”. Contract Nr.LTC-14-000096. Project Manager;

Egils Ginters

2017 – 2021 FLAG-ERA FuturICT 2.0 "Large scale experiments and simulations for the second generation of FuturICT" Project type: Horizon 2020 Group leader. Total project budget: € 2 614 527

2011 – 2015 FP7-ICT-2011-7 IP FUPOL No. 287119 “Future Policy Modelling (IP)" 10.11.2021 © Eiropas Savienība, 2002-2021 | http://europass.cedefop.europa.eu Lapa 5/26 Work package manager. Project type: FP7 Total project budget: € 9 102 880

Jānis Grundspeņķis

2014 – 2017 SOPHIS project of the national research program “Ontology-based knowledge engineering technologies suitable for web environment” Sub-project manager

2013 – 2016 Latvian Science Council project “Modeļu un metožu izstrāde lietišķai intelektuālai

programmatūrai pamatojoties uz izkliedētu mākslīgo intelektu, zināšanu pārvaldību un progresīvām tīmekļa tehnoloģijām" Project Manager

Lienīte Litavniece

2022 – NOW Latvian Science Council project "Lēmumu pieņemšanas sistēmas izstrāde viedai augļkopībai pielietojot autonomus bezpilota lidaparātus" (lzp-2021/1-0134) Leading researcher. Total project budget: 299999.70 EUR

01/10/2020 – 31/12/2020 National research program "Dzīve ar COVID-19: Novērtējums par koronavīrusa izraisītās krīzes pārvarēšanu Latvijā un priekšlikumi sabiedrības noturībai nākotnē (COVIDzīve)"(Nr.VPP-COVID-2020/1-0013)" Leading researcher. Total project budget: 497 580 EUR

2018 RAT scientific grant for research "Rēzeknes pilsētas ēdināšanas uzņēmumu kvalitātes novērtējums" (Nr.16.7/11) Manager, researcher

2018 Project financed by the Baltic-German Higher Education Office "Effects of structural and socialchange on municipalities in Germany and the Baltic States (CLIMBING)" (Nr.2018/5) Project manager

2017 RAT scientific grant for research "Riebiņu novada kultūras un dabas vērtību saglabāšana un atjaunināšana" (Nr.13.15/5) Manager, researcher

2017 RAT scientific grant for research "Tūrisma produktu novērtēšana Rēzeknes novadā(kvalitātes audits)" (Nr.13.15/4) Manager, researcher

2016 RAT scientific grant for research "Tūrisma produktu attīstības iespējas Lūznavas muižā" (Nr.13.15/2) Manager, researcher

2016 RAT scientific grant for research "Izmitināšanas pakalpojumu attīstības iespējas Rēzeknē" (Nr.13.15/12)

3.4.5. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study programme and study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

Cooperation with the teaching staff of Rēzekne Academy of Technologies, which has been started in previous reporting periods, continues. The teaching staff cooperates in the implementation of courses and supervision of doctoral theses, and also within the framework of monthly seminars for doctoral students. On average, once a month, but no less than once a semester, joint seminars for doctoral students are held, within the framework of which the teaching staff of Vidzeme University of Applied Sciences and Rēzekne Academy of Technologies, and also various visiting lecturers give presentations on various types of topics within the field which are topical for doctoral students. Here are some examples of the guest lecture topics presented during the seminars – "Science communication", "Options of Microsoft tools to support research work", "Simple and complex applications of artificial intelligence", "Options of GIS in modern research (samples, tools)", "Introduction to research, processes. Using LaTex, Overlief platform. Use of library resources", "Experiences in utilization of GIS and spatial data visualization in international research projects",

“Economic and mathematical methods and models for use in research”. During doctoral seminars, doctoral students also present topics and progress of their theses, they have an opportunity to get feedback from experienced professors and researchers. In a similar way, on average once a year, winter/summer schools for doctoral students are jointly organized, with the participation of local and international guest lectures. During these events, doctoral students present topics of their theses. These winter/summer doctoral schools are very appreciated by doctoral students, because often during this time, thanks to feedback, doctoral students manage to proceed with their topics in the case they were stuck in their work.

In order to successfully implement the programme, both parties involved in the study programme have agreed to create a programme council which monitors and coordinates activities necessary for the successful implementation of the programme. The council consists of 6 people, 3 of whom will be appointed by RAT, and 3 will be appointed by ViA in accordance with the procedures specified in the regulatory documents of each higher education institution.

The Board of the Study Programme is composed of professors, associate professors or researchers involved in the field of study.
Cooperation between partner universities in the course delivery processes and in the mechanism for the provision of study materials has so far been case-oriented. However, both parties involved in the implementation of the programme have agreed on a common mechanism for the provision of study materials to students through cross-platform connections such as MS Office, including email, SharePoint sites and MS Teams.
The interconnection of courses of study is monitored and managed by the Programme Director and the Programme Board, so that, where necessary, the programme directors at both universities also facilitate the interconnection of teaching staff. Course descriptions specify the prerequisites for successful completion of the course, so that the interlinkages between courses can be tracked. In turn, the meetings of the programme council, the faculty council and the general meetings of the faculty promote cooperation between teaching staff in the context of the programme, the programme and the faculty. At the end of the calendar year, all faculty members involved in study programmes have the opportunity to participate in a Faculty Council meeting or a general meeting, during which programme directors report on current developments, student evaluations and challenges in programme implementation.

At the time of submitting the self-assessment report, the ratio of the number of teaching staff is 0.71 – students (10), teaching staff (14).

Annexes

III - Description of the Study Programme - 3.1. Indicators Describing the Study Programme		
Sample of the diploma and its supplement to be issued for completing the study programme	41P_SSId_Diploma_paraugs_Diploma_example-red-corr.docx	41P_SSId_Diploma_paraugs_Diploma_example-red-corr.docx
For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions (if applicable)		
Compliance of the joint study programme with the provisions of the Law on Higher Education Institutions (table) (if applicable)	42P_SSId_Atbilstiba_Augstskolu_lik_SSMd_ENG_labots.docx	42P_SSId_Atbilstiba_Augstskolu_lik_SSMd_LV_labots.docx
Statistics on the students in the reporting period	2P-Studentu-statistika-2013-2022-AIKA-visi-StudentStatistics-corr.xlsx	2P-Studentu-statistika-2013-2022-AIKA-visi-StudentStatistics-corr.xlsx
III - Description of the Study Programme - 3.2. The Content of Studies and Implementation Thereof		
Compliance with the study programme with the State Education Standard		
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard or the requirements for professional qualification (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)	SSI-comfirmation.docx	SSId-izzina.docx
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	45P_SSId_Kartēšana_Mapping_labots.xlsx	45P_SSId_Kartēšana_Mapping_labots.xlsx
The curriculum of the study programme (for each type and form of the implementation of the study programme)	43P_SSId_plans_English.xlsx	43P_SSId_plans_Latviski.xlsx
Descriptions of the study courses/ modules	44P-SSId_Kursu apraksti-Course Descriptions.zip	44P-SSId_Kursu apraksti-Course Descriptions.zip
Description of the organisation of the internship of the students (if applicable)		
III - Description of the Study Programme - 3.4. Teaching Staff		
Confirmation that the academic staff of the doctoral study programme includes not less than five doctors, of which at least three are experts approved by the Latvian Council of Science in the branch or sub-branch of science in which the study programme intends to award a scientific degree (if applicable)	Apliecinajums-Par SSMd akademiska personala sastavu_v2.edoc	Apliecinajums-Par SSMd akademiska personala sastavu_v2.edoc
Confirmation that the academic staff of the academic study programme complies with the requirements specified in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions (if applicable)	Apliecinajums-Par SSMd akademiska personala sastavu_v2.edoc	Apliecinajums-Par SSMd akademiska personala sastavu_v2.edoc

Virtual reality and smart technologies (47484)

Study field	*Information Technology, Computer Hardware, Electronics, Telecommunications, Computer Management, and Computer Science*
ProcedureStudyProgram.Name	*Virtual reality and smart technologies*
Education classification code	*47484*
Type of the study programme	*Professional master study programme*
Name of the study programme director	*Edmunds*
Surname of the study programme director	*Jansons*
E-mail of the study programme director	*edmunds.jansons@va.lv*
Title of the study programme director	*Mg.sc.comp.*
Phone of the study programme director	*26818099*
Goal of the study programme	*To provide information technology students with the opportunity to acquire the necessary competences and prepare them for professional activities in the field of augmented reality solutions development to become highly qualified virtual and augmented reality (VR/AR) specialists.*
Tasks of the study programme	*- To provide students with practice-oriented higher professional education in the fields represented by the field of study;* *- To ensure a study process that meets the requirements of the legislation, the labour market and a student-centred approach to higher education;* *- To develop students' scientific research skills, to create motivation for further education and to encourage students' further self-education;* *- Ensure the development of diverse personal skills;* *- To create an adaptable training offer for companies and their employees in the field of study specialisations.*

Results of the study programme	*1. Deeply understands the principles of augmented reality, including spatial geometry, computer vision algorithms, machine learning and the fundamentals of neural networks; be able to apply this knowledge in research and be able to develop innovative solutions related to augmented reality;* *2. Able to perform programming tasks and authoring activities involving three-dimensional content management on websites and independent platforms using high-level programming languages, game engines, special libraries and standards;* *3. Able to implement different approaches to three-dimensional computer modelling, including animation description and process automation, as well as synthesis and interaction of different content;* *4.Able to plan and implement virtual and augmented reality projects, implementing new ideas that go beyond standard solutions;* *5. Able to design the physical structure of new systems based on an in-depth knowledge of specific virtual and augmented reality equipment technologies, technical parameters, performance characteristics, interoperability issues and supported platforms;* *6. Able to develop the content of a software solution by integrating self-developed scenarios in interactive modes based on intelligent game approaches and game mechanics;* *7. Consider and respect aspects of the user experience and integrate them into the developed platforms and applications of virtual and augmented reality;* *8. Able to explain and discuss the principles and technologies of virtual and augmented reality in a reasoned way with both specialists and lay people;* *9. Able to ensure the sustainable development and use of virtual and augmented reality solutions through successful project management, teamwork, communication of results and publicity in both professional and scientific environments, based on state-of-the-art approaches.*
Final examination upon the completion of the study programme	*Master's Thesis*

Study programme forms

Full time studies - 1 years, 6 months - latvian

Study type and form	*Full time studies*
Duration in full years	*1*
Duration in month	*6*
Language	*latvian*
Amount (CP)	*60*
Admission requirements (in English)	*Professional bachelor's degree, professional second cycle or equivalent higher education qualification in information technology or computer science, completed full-time in a programme of study of at least four years' duration*

Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Professional master's degree in virtual reality and smart technologies*
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Vidzeme University of Applied Sciences	VALMIERA	CĒSU IELA 4, VALMIERA, VALMIERAS NOVADS, LV-4201

Full time studies - 1 years, 6 months - english

Study type and form	*Full time studies*
Duration in full years	*1*
Duration in month	*6*
Language	*english*
Amount (CP)	*60*
Admission requirements (in English)	*Professional bachelor's degree, professional second cycle or equivalent higher education qualification in information technology or computer science, completed full-time in a programme of study of at least four years' duration; Level of English language proficiency at least at B2 level*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Professional master's degree in virtual reality and smart technologies*
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Vidzeme University of Applied Sciences	VALMIERA	CĒSU IELA 4, VALMIERA, VALMIERAS NOVADS, LV-4201

3.1. Indicators Describing the Study Programme

3.1.1. Description and analysis of changes in the parameters of the study programme made since the issuance of the previous accreditation form of the study field or issuance of the study programme license, if the study programme is not included on the accreditation form of the study field, including changes planned within the evaluation procedure of the study field evaluation procedure.

There were some changes made in the course content of the study programme - the study course "VR/AR Hardware and Physical Structure, Elements of IoT" title changed to "VR/AR Hardware and Physical Structure". The changes made to the course are aimed at broadening the content in relation to virtual and augmented reality technological solutions, while reducing the amount of material related to IoT technologies in the lecture content. The changes have been made because of the decision to focus the content of the course on virtual and augmented reality solutions, following a comprehensive analysis of the course content. In addition, changes have been made to the course content during the period, replacing the course "3D graphics programming at advanced level" with "Internet-based VR and AR applications".The changes were made due to the fact that the original course title did not reflect the main objective of the course and current developments in the field, which include a focus on the optimisation of augmented reality solutions for use in the Internet environment.

Changes have been made to the course “Simulation modelling and data 3D visualisation”. The content of the course has been revised and changes have been made in line with the requirements of the labour market and specifically the market situation for augmented reality solutions. The course content includes new types of methods, including the implementation of 3DBI data visualisation, as well as basic skills for 3D integrated data visualisation in PowerBI data analytics and augmented reality solutions.

3.1.2. Analysis and assessment of the study programme compliance with the study field. Analysis of the interrelation between the code of the study programme, the degree, professional qualification/professional qualification requirements or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements. Description of the duration and scope of the implementation of the study programme (including different options of the study programme implementation) and evaluation of its usefulness.

The study programme "Virtual Reality and Smart Technologies", corresponds to the field of study as it provides higher professional education in the field of information technologies. In accordance with the title of the study programme, students acquire the skills and experience necessary for a developer-engineer of virtual reality solutions. Thus, upon graduation, students are awarded the Professional Master's Degree in Information Technology. The aim of the study programme is to provide students with the opportunity to acquire all the necessary skills to work professionally in the field of virtual and augmented reality, developing VR/AR solutions, or performing project design and implementation supervision duties.

The programme ensures the integration and modularity of the courses. The aim of the programme offered by VIA is to provide information technology students with the opportunity to acquire the necessary competences and prepare them for professional activities in the field of augmented reality solutions development in order to become highly qualified virtual and augmented reality (VR/AR) specialists.
The aim of the programme developed and offered by VIA is to provide information technology students with the opportunity to acquire the necessary competences and prepare them for professional activities in the field of augmented reality solutions development in order to become highly qualified virtual and augmented reality (VR/AR) specialists. The aim of the study programme is in line with the achievable objectives of the programme, including providing students with practical professional experience, ensuring a student-centred study approach, facilitating students' further educational aspirations, and providing training of professionals necessary for the needs of the Latvian VR/AR industry. The study process motivates the involvement of students and graduates in the research activities of Vidzeme University of Applied Sciences, as well as in student grant research, thus contributing to the practical experience of young professionals.

The content of the study programme allows to achieve in-depth understanding and acquire professional skills in one of the fastest growing sectors. The programme integrates courses into modules, thus ensuring a sequential and logical development of the competences required for a professional in the field. According to forecasts, the virtual and augmented reality market in the European Union will grow at an average annual rate of 35% between 2018 and 2026. At the same time, market turnover will grow from €389 million in 2018 to €4305 million in 2026. Meanwhile, globally, the industry's total market share reached USD 27.6 billion in 2021, while it is forecast to reach USD 856.2 billion in 2031, with a compound annual growth rate of 41.1%. It should be noted that the Professional Master's degree programme "Virtual Reality and Information Technologies" is currently the only one in Latvia that trains specialists in this specific field. Thus, the study programme, its objectives and content are successfully integrated into the field of study.

The programme provides students with a broad knowledge focusing on key areas of mobile technology, augmented and virtual reality, creating an understanding of industry issues, challenges and solutions to create innovative solutions. The title "Virtual Reality and Smart Technologies" is in line with the content of the study programme. It includes the most substantive part of the study subjects, which focuses on smart technologies. The "smart technologies" part of the title emphasises the diversity of the study programme, including the opportunities to analyse other technologies - including augmented reality (AR), mixed reality (MR) - and to examine the place and importance of smart systems and microcontrollers in the study content of the course of study that the programme is pursuing.

The degree to be awarded under the programme, the Professional Master's Degree in Virtual Reality and Smart Technologies, is relevant to the experience and nature of the study programme.
The programme includes subjects which require prior knowledge in the IT field, therefore one of the admission requirements is a professional bachelor's degree, a second level professional or equivalent higher education qualification in information technology or information and communication technology or an equivalent field, followed by a full-time study programme of at least four years' duration.
The admission requirements for the programme shall require that the candidate has (1) a professional bachelor's degree, (2) a second-level professional qualification (3) or an equivalent higher education qualification in information technology or computer science, completed on a full-time basis in a programme of study of at least four years' duration. The evaluation criteria for admission to the programme shall be the weighted average mark in the Diploma Supplement*, with

a weighting of 100 %. An additional condition for foreign applicants is a pass mark in the interviews^^; an average mark in the Diploma Supplement of at least 60% of the maximum possible mark.
In the situation where a prospective student has a Bachelor's degree in another field of science but is professionally active in the field of augmented reality or IT, the reflectant will be offered an experience recognition process during which a committee appointed by the faculty will assess whether the existing work experience and professional knowledge are relevant and appropriate to enable the student to undertake studies in this programme.

The content of the study programme corresponds to code 47482 and ISCED code 0613 - 'Development and analysis of software and applications', as the study programme will enable students to work with technological support in the field of VR/AR to develop VR/AR software and to analyse solutions at different stages of their development.

The study programme is full-time - the total duration of the programme is three semesters (1.5 years), with a Master's thesis in the third semester. The programme is of a size appropriate to a Master's degree programme. Successful completion of the subjects, internship and state examination leads to 60 CP.

Refer to the annex for the Sample of the diploma and its supplement to be issued for mastering the study program (see Annex 48).

3.1.3. Economic and/ or social substantiation of the study programme, analysis of graduates' employment.

Vidzeme University of Applied Sciences offers a study programme whose content provides the knowledge and skills required by virtual and augmented reality professionals in the labour market.
The Professional Master's study programme "Virtual Reality and Mobile Technologies" is designed to provide science-based and practically oriented master's level education to meet the rapidly growing market demand for virtual and augmented reality professionals and experts in Latvia and the world, which includes professions such as virtual and augmented reality system designers, content developers, programmers, project managers, scenario engineers, as well as three-dimensional (3D) and 360 degree content, special effects, designers, modellers and technicians.

Graduate surveys have been carried out to identify employment trends.

The 2021 survey has 50% (5 respondents) of the 2018/2019 academic year graduates and concludes that 100% of respondents are employed, including four in the private sector and one in the public sector. Among the respondents, 40% are employed in Valmiera, while 60% are employed in Riga. The most important competences in professional activity are teamwork and cooperation skills; analytical and critical thinking skills; problem solving skills; information acquisition, selection and analysis skills; practical use of IT tools.

3.1.4. Statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down into different study forms, types, and

languages.

During the period under review, student attrition has been observed, which is attributed to students' inability to combine academic study load with full-time professional employment in the IT sector. This situation is attributable to the general high employment rate of students in Latvian higher education institutions and at the same time to the difficulties in fully engaging in the study process. In order to limit this risk, Vidzeme University of Applied Sciences implements contact hours on Thursdays, Fridays and Saturdays. This creates conditions for students to reconcile their professional and academic life.

The study process is conducted in English, given the presence of foreign students. In view of the current trends, it can be expected that foreign students will continue to participate in the study process in the years to come. At the same time, the number of domestic and foreign students is not so large that it is economically feasible to provide separate Latvian and English language streams.

	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
Number of students	11	11	7	13	10
Number of matriculants	11	0	9	6	6
Student dropout	0	0	2	0	2
Number of graduates	0	0	10	5	n/a

Refer to the annex for student number dynamics during the assessment period (see Annex 2).

3.1.5. Substantiation of the development of the joint study programme and description and evaluation of the choice of partner universities, including information on the development and implementation of the joint study programme (if applicable).

3.2. The Content of Studies and Implementation Thereof

3.2.1. Analysis of the content of the study programme. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators with the aims of the study course/ module and the aims and intended outcomes of the study programme. Assessment of the relevance of the content of the study courses/ modules and compliance with the needs of the relevant industry, labour market and with the trends in science on how and whether the content of the study courses/ modules is updated in line with the development trends

of the relevant industry, labour market, and science.

The study programme is a new type of higher-level master's study programme. In academia, VR/AR solutions are often included in the research work of research institutes, and in IT-related degree programmes, separate VR/AR course modules are relatively often taught. Meanwhile, there are relatively few study programmes in Europe that offer VR/AR at an advanced level.

In Europe, virtual and augmented reality studies are in most cases possible as part of specific study programmes, such as:

- Digital Learning Games - Tallinn University
- Serious Games - University of Skovde
- Game and Media Technology - Utrecht University
- eXtended Artificial Intelligence - University of Würzburg
- Design for Creative and Immersive Technology - Stockholm University
- Serious Games and Virtual Reality - Glasgow Academy of Art
- Immersive Technologies (Virtual and Augmented Reality) - University of Bristol
- Virtual Reality and Augmented Reality - Lund University
- Master in Design for Virtual Reality - IED Istituto Europeo di Design
- Virtual and Augmented Reality - Goldsmiths University of London
- Innovation and Immersive Technologies - University of Bologna
- Master Class Augmented & Virtual Reality - University of St. Polten

The majority of the study programmes are focused on game development and relatively less on the development of practical and serious VR/AR solutions. Thus, in the Baltic and CEE region, only the offer of the University of St. Polten is similar to such a Master's programme.

The content has been developed considering the labour market trends identified in cooperation with professional associations: the European Social Simulation Association, the LogNet education network European Logistics Association, the State Employment Agency, the Confederation of Employers of Latvia, the Latvian Association of Travel Agents, the Latvian National Association of Freight Carriers, the Latvian Association of Computer Technologies. The content of study courses and modules is regularly reviewed.

The content of the study programme is reviewed once a year, with suggestions being made to the lecturers in individual discussions before the start of the academic year. Such changes may include suggestions for linking lecture content to current developments in the field, such as the issue of the nuances of the multi-user experience in a metaverse environment.

Starting from 2018/2019, within the framework of the "Growth and Employment" Specific Support Objective (SAM) 8.2.1 "Reduce fragmentation of study programmes (SP) and strengthen resource sharing" project "Establishment and Approval of New Master's Study Programmes to Promote International Competitiveness of Vidzeme University of Applied Sciences" Nr.8.2.1.0/18/A/011), activities are being implemented aimed at updating the content and organisational aspects of the study programme in line with the needs of the sector and the latest scientific developments. An Industry Advisory Board has been set up within the framework of the study programme, which includes representatives of companies in the field of virtual reality. The Council's tasks are to promote the alignment of the study aims and objectives, as well as the chosen study methods, with the needs of the labour market. The Advisory Board meetings are part of the programme and have identified several improvements to be made and potential changes to be made to the positioning and possible future development of the programme.

Industry Advisory Board meetings are organised once a year, while the latest news and proposals from industry representatives and Advisory Board members are also gathered during the annual hackathon, when local and international industry participants gather at Vidzeme University of Applied Sciences. The most important proposals include the need to introduce course content related to the development and usability of Unreal Engine games into the study content.

The planned learning outcomes are in line with the European Qualifications Framework for Higher Education (Bologna Process) and the European Qualifications Framework for Lifelong Learning (EQF Level 7). The study programme is related to the requirements of the Software Engineer professional standard, but with a focus on virtual and augmented reality systems involving the use of mobile technologies. The programme is designed to meet the requirements of the Latvian Qualifications Framework (LQF) Level 7, ensuring appropriate knowledge, skills, and competences.

Level 6 of the Latvian Qualifications Framework for the profession "Software Engineer" has been agreed at the meeting of the Tripartite Sub-Council for Vocational Education and Employment of 15 December 2021, Minutes No 7.

Description available (only in Latvian): https://registri.visc.gov.lv/profizglitiba/dokumenti/nozkval/old/NKS_elektron_un_ikt_20211215.pdf

- A software engineer plans, organises, and develops software according to the conditions of functionality, quality and resource intensity by preparing and configuring the development environment and writing code according to design and coding guidelines.
- Designs software architecture, implements and maintains software, processes resulting problem reports and analyses sources of errors.
- Organises and carries out software testing and analysis of results.
- Applies appropriate software development tools, testing methods and programming languages.

Given that there are currently no requirements for the award of a professional qualification at master's level in the field of Virtual Reality in the field of Augmented Reality Engineering, it is not possible to analyse the study programme against the professional standard/professional map.

The objectives and outcomes of the study courses are interlinked with the objectives and outcomes of the study programme, based on a highly detailed mapping system of the overall programme and the objectives and outcomes of the study courses. The objectives and outcomes of the relevant courses are adapted on the basis of the overarching objectives and outcomes of the programme.

Refer to the annex for Informative report on the compliance of the study program with the state education standard (see Annex 49).

Refer to the annex for Study program plan (see Annex 50).

Refer to the annex for Descriptions of study courses of the study program (see Annex 51).

Refer to the annex for Mapping of study courses to achieve the study results of the study program (see Annex 52).

Refer to the annex for the relevance of the NQF learning outcomes to the study modules and expected learning outcomes (see Annex 53).

3.2.2. In the case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation. In the case of a doctoral study

programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels (if applicable).

According to the title of the study programme, during the implementation of the programme the students acquire the skills and experience necessary for a developer-engineer of virtual reality solutions, the degree to be awarded in computer science is relevant to the content of the study programme.Thus, upon graduation from the study programme the students are awarded the professional master's degree "Information Technologies".

The study programme does not currently lead to a qualification - at national level, there is no corresponding qualification "virtual reality engineer". In view of this, it is not possible to award a professional qualification to graduates. In discussions with members of the Advisory Board and in-depth discussions with representatives of the AR/VR industry, the programme promoter has concluded that the qualification would not provide added value to graduates in the current market situation. This is to be addressed by changing the type of study programme to an academic study programme. The content and scope of the studies (60 CP) are in line with the chosen type of study.

3.2.3. Assessment of the study programme including the study course/ module implementation methods by indicating what the methods are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. In the case of a joint study programme, or in case the study programme is implemented in a foreign language or in the form of distance learning, describe in detail the methods used to deliver such a study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

Student-centred educational approach in the implementation of the study programme is manifested in the possibility for students to work on the topic of their individual final study work during the study process. Each student is motivated to define the topic of his/her final thesis at the beginning of the study process. In this way, during the study process, students can validate the relevance and topicality of their chosen topic in the field. Students can contact lecturers and study programme management for consultations on the study process, issues of study thesis topic development, as well as on the possibilities of combining the final study thesis with research topicalities within the framework of research conducted by the Institute of Sociotechnical Systems Modelling of Vidzeme University of Applied Sciences.

The study programme has a modular structure, which allows the combination of courses, improving the quality and control of teaching and promoting the integrity of studies. The study programme consists of modules and individual study courses. A module consists of a number of logically interlinked courses of study, the acquisition of which together provides the scope of knowledge and skills that have been defined in the construction of the module of study. Final examinations are organised within the modules, and in some cases at the end of an individual course.

There are five modules in the study programme:

VR/AR project planning and implementation (6 CP);

VR/AR project authoring (8 CP);

User experience design and implementation (6 CP);

Recognition services and intellectual environments (6 CP);

VR/AR project sustainability and transformation (8 CP).

The student's academic obligations and the requirements for their fulfilment within a specific course of study shall be determined by the course description.

- The course timetable shall determine the implementation and structure of the academic commitment calendar.
- The course description shall be developed by the lecturer in accordance with the guidelines approved by the academic and scientific vice-rector and submitted to the director of the field of study, who, on the proposal of the field council, shall forward it to the faculty council for approval.

The lecturer is obliged to ensure that the course description and the timetable are available to students.

The basic forms of academic commitment examinations at ViA are:

- examination - a form of testing students' knowledge, skills and competence in writing or orally with a score on a 10-point scale.
- examination - a form of written and/or oral assessment of the student's knowledge, skills, and competence with a mark of "pass" or "fail" or a mark out of 10 (differentiated examination). The examination may be organised for all, or part of the material covered in the course of study in accordance with the requirements laid down in advance by the course lecturer. One of the forms of credit is the elaboration and defence of a practice report. A placement report is a written report on the student's placement, prepared in accordance with the regulations approved by the governing body of the academic unit concerned.
- the preparation and defence of an annual project. The annual project is an independently carried out theoretically based and practically oriented summary of research results or a project with a score out of 10 and the procedure for which is determined by the regulations approved by the governing body of the academic unit concerned.
- national examination - the elaboration and defence of a qualification thesis, bachelor's thesis, and master's thesis with a mark out of 10, the procedure for which is determined by the governing body of the relevant academic unit.

The lecturer may specify other forms of examinations in the course description, which may include control works, research works or projects, their defence and other examinations that are organised while studying the course during the semester and cover some part of the material to be studied.

The assessment of the knowledge, skills and competence acquired during study course shall be expressed in the final assessment of the study course, which shall be made based on a cumulative system with a mark of "pass" or "fail", or a mark on a scale of 10 points.

The academic obligations of the study course shall be deemed to have been fulfilled if the final mark on the 10-point scale is not lower than,,4, or a mark of 'pass' is obtained. The student shall not be entitled to retake the examinations if the final grade of the study course has been passed. Students who have not fulfilled their academic obligations in accordance with their chosen study programme within the semesters specified in the study timetable shall be in academic arrears. Academic defaulters have the right to request an extension of their academic obligations or

permission to resume one or more courses of study by submitting an application to the Director of the Study Department. On the proposal of the Director of Studies, an order shall be issued by the Vice-Rector for Academic and Research Affairs.

Students whos final grades are not lower than "8" and whose grade in the state examination is "9" or "10" shall receive a diploma of distinction of ViA.

The implementation of the student assessment procedure is supervised and controlled by the management of the academic unit responsible for the implementation of the programme, the Study Administration Group of the Administrative Department and the Academic and Scientific Vice-Rector. Student assessment takes place in the framework of the study courses, in the defence of internships, annual projects, bachelor's and master's theses.

ViA follows the following basic principles of evaluation:

1) The principle of summation of positive achievements - the education acquired is evaluated by summing up positive achievements.

2) The principle of obligatory assessment - it is necessary to obtain a positive assessment for the completion of the core parts of the programme.

3) The principle of openness and clarity of requirements - a set of core requirements for the assessment of learning is defined in accordance with the aims and objectives of the programme.

4) The principle of relevance of assessment: the assessment work provides an opportunity to demonstrate analytical and creative abilities, knowledge, skills and competences in tasks and situations appropriate to the different levels of learning. The content of the examination papers shall be consistent with the content of the course syllabuses and the requirements for skills and knowledge set out in the educational standards.

The final assessment of the course may include an evaluation of the student's performance throughout the course, for example: participation and quality of work in lectures, seminars and practicals, results of control work, results of independent homework, assessment in a final examination or a final examination.

A student's independent written work may be an assignment, a report, a problem study, an analysis of a publication, a summary and evaluation of factual material.

Information on the conditions and requirements for the final examination is reflected in the course description and in the lecturer's "Instructions to students for studying the course". All information and requirements concerning the preparation and defence of the Master's thesis are summarised in the Methodological Instructions.

The requirements for examinations in the course of study are approved by the Programme Director. At the end of the programme, the student takes the final state examination defends the Master's thesis.

3.2.4. If the study programme envisages an internship, describe the internship opportunities offered to students, provision and work organization, including whether the higher education institution/ college helps students to find an internship place. If the study programme is implemented in a foreign language, provide information on how internship opportunities are provided in a foreign language, including for foreign students. To provide analysis and evaluation of the connection of the tasks set for students during the internship included in the study programme with the learning

outcomes of the study programme (if applicable).

The Virtual Reality and Smart Technologies study programme requires a 6-week internship to test and consolidate the knowledge and skills acquired in the study programme by working in a specific company and participating in company projects. The internship is equivalent to 6CP and is carried out in the second semester. The internship provides opportunities to test students' acquisition of practical skills in parallel with practical tasks and laboratory work. The requirements for the internship are defined in the regulations approved by the VIA Engineering Faculty Council and include the following tasks:

- Contribute to the design and organisation of a specific project or study.
- Process and analyse data from the project or study.
- Create a logical model of the object of the project or study at a freely chosen level of abstraction.
- Develop a prototype or part of a prototype of a given system involving the use of virtual or augmented reality technologies.
- Evaluate and analyse the progress of the project or study.
- Contribute to the generalisation and implementation of the knowledge and skills acquired in the study programme in a specific practice company.
- To carry out other tasks which develop and consolidate the theoretical and practical knowledge of the trainee, and which are determined by the traineeship supervisor – mentor

After the internship, students submit an internship report, which includes a description of the work carried out during the internship and an analysis of the results. The internship defence takes place in the presence of a committee appointed by the Faculty of Engineering. The results of the internship are equated in the recognition of the internship results - one week of internship corresponds to one credit point. If the internship is not credited, it must be repeated.

All students, including international students, have the opportunity to apply for an Erasmus+ international placement. It should be noted that in the information technology sector, there are no language barrier challenges in the employment environment, as those working in the industry are proficient in English. Thus, there are no difficulties for foreign students to find internships in the Latvian labour market. At the same time, Vidzeme University of Applied Sciences promotes students' contact with cooperation companies such as Exonicus, Vividly, Exonicus, Overly, Accenture and others. The close cooperation agreement signed with SiA Exonicus, which specifically provides for the provision of internship and research opportunities for students of Vidzeme University of Applied Sciences, is particularly noteworthy, while the company carries out its activities in the premises of Vidzeme University of Applied Sciences.

The assessment of the internship is made up of the following components:

1. Curator's assessment- 50%.
2. Evaluation of internship report - 25%.
3. internship defence - 25%.

The internship is not credited if:

4. negative feedback on the trainee's behaviour, negative and careless or irresponsible attitude towards work duties.
5. failure to submit a placement report or failure to meet the quality requirements.

Cooperation agreements with organisations and companies that are leaders in the field in Latvia

have been concluded to provide students with internships. Cooperation agreements on internship opportunities have been concluded with SIA Overly, SIA Anatomy Next, SIA Exonicus SIA Orange, SIA Vividly, SIA Modern Media, SIA LMT and the Latvian branch of Accenture. At the same time, an in-depth cooperation agreement has been concluded with SIA Exonicus, thus ensuring the availability of internships and opportunities for scientific cooperation.

Refer to the annex for the Internship Regulations for IT students (see Annex 61).

3.2.5. Evaluation and description of the promotion opportunities and the promotion process provided to the students of the doctoral study programme (if applicable).

3.2.6. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the marks of the final theses.

During the reporting period 15 Master's theses have been defended between 2020 and 2022. Of these, six are on topics related to pedagogy and training, three are in the field of medicine and rehabilitation, and the remaining six are on the wider use of augmented reality technologies in different sectors. Analysing the dynamics of the final paper grades, in 2020 the arithmetic mean grade was 7.7 and the median 7.5, while in 2022 the arithmetic mean grade was 7.8 and the median 8. Thus, the quality of the final theses tends to increase.

Entries are judged on criteria such as: (1) Situation analysis, statement of objectives, methods used, economic justification of the topic, results and conclusions; (2) Structure of the paper; (3) Compliance with the rules (title page, abstract, abbreviations, contents, introduction, main parts, reference list, references, tables, figures, numbering, font size); (4) Language of the paper (literary and grammatical quality, use of technical terms); (5) Assessment of the author's theoretical knowledge; (6) Assessment of the author's technical skills.

The topics of the national examination papers are related to various practical industrial and technological VR/AR challenges (4 topics); industrial training (3 topics); education (3 topics); medicine (3 topics) and tourism (2 topics). The analysis of the topics of the national test papers shows a trend where the chosen topics reflect the current trends in the industry and the most popular applications of VR/AR solutions - including the education and medical sectors.

Table No.13. Topics of the Master's theses.

Nr. p. k.	Tēma	Atzīme	Gads
1.	Human posture assessment in augmented reality	7	2022
2.	Virtual reality learning tool for chemistry lessons	7	2022
3.	Mixed reality as a tool for training with different electrical equipment	8	2022

4.	Application and evaluation of safety equipment in industrial training scenarios	8	2022
5.	Evaluation of the applicability of biometrics in virtual reality meditation experiences	9	2022
6.	Three-dimensional (3D) reconstruction of a tourist site in augmented reality	6	2020
7.	Augmented reality solution for the online sale and purchase of bulky goods	6	2020
8.	Semi-aware neural networks in a discrete environment	7	2020
9.	Application of augmented reality technologies to the teaching of science in primary school	7	2020
10.	Virtual reality technology as a tool for training people for job interviews	7	2020
11.	Virtual reality as an aid for teaching physics in secondary school	8	2020
12.	Development of a virtual reality solution for improving trunk stability and cognitive abilities	9	2020
13.	Development of a prototype virtual version of the permanent exhibition "Books in Latvia" at the National Library of Latvia	9	2020
14.	Transfer of existing fast action game mechanics into virtual reality	9	2020
15.	Fast and automated 3D portrait scanning and adaptation to virtual and augmented reality	9	2020

3.3. Resources and Provision of the Study Programme

3.3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples.

The resources available for the study program (including financial resources) and the material and technical support allow the qualitative implementation of the study program, are in accordance with the study content, providing the opportunity to successfully organize the study process.

Additional information on the provision of resources available for the implementation of the study program is available in the *Part II, Section 2.3., paragraphs 2.3.1. to 2.3.3.* of the report, where the resources of the study direction are listed. In addition, teaching aids such as Miro's digital idea circulation system are used in the classes, while lectures in a remote format are conducted using the capabilities provided by the Teams platform. The material and technical base is made up of software (for example, Unity, Blender 3D) according to the requirements of the study program. - The latest and most modern virtual and augmented reality equipment is available for the projects implemented in study courses and during the study process. The Virtual Reality Lab has 20 sets that include high-performance computers, VR/AR equipment from manufacturers such as Daqri, ODG, Microsoft Hololens 2, Samsung, Vive, Oculus, Meta Quest 2, and more.

At the same time, students are actively involved in research and usability projects as part of their internships, which gives them very good experience in the practical implementation of augmented

reality projects. Every year, as part of the study process, a virtual and augmented reality hackathon is organised, aimed at testing students' skills in developing working prototypes under high mental load. Students work in groups, which often include third-party industry representatives and industry stakeholders who provide additional information on the latest techniques, their practical applicability, and expand students' professional network.

3.3.2. Assessment of the study provision and scientific base support, including the resources provided within the framework of cooperation with other science institutes and higher education institutions (applicable to doctoral study programmes) (if applicable).

3.3.3. Indicate data on the available funding for the corresponding study programme, its funding sources and their use for the development of the study programme. Provide information on the costs per one student within this study programme, indicating the items included in the cost calculation and the percentage distribution of funding between the specified items. The minimum number of students in the study programme in order to ensure the profitability of the study programme (indicating separately the information on each language, type and form of the study programme implementation).

ViA does not divide infrastructure by study programmes, resources are assessed for the entire higher education institution as a whole. The base available for the implementation of the VRST study programme (lecture-rooms, computer classes, laboratory, and library resources, computer software) is sufficient.

See Part II, Section 2.3., paragraphs 2.3.1. to 2.3.3. of the report for an extended list of available resources in the field of study.

3.4. Teaching Staff

3.4.1. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

In the implementation of the study programme there are involved both VIA elected teaching staff, as well as guest lecturers. The main criteria for selection of lecturers are: education (degree), professional experience, research and creative activity, communication skills.

There are also lecturers involves from the industry in the implementation of the study programme: all have a Master's degree or a PhD; lecturers in specialised courses have a background relevant to the field of study. Most of the lecturers are practising professionals, industry experts. The main duties of a lecturer include: preparation and implementation of study courses in accordance with the university timetable; promotion of students' discussion skills and independent thinking; testing of students' knowledge and skills acquired in the study course using various forms of examination; conducting consultations; improvement and supplementation of the material and technical base; planned performance of methodological work; continuous improvement of pedagogical and scientific qualifications in the specialised field.

The academic and scientific staff involved in the implementation of the study programme have been involved in improving the quality of the study programme by involving other lecturers in the hospitalization and content analysis of the study courses.

In the academic year 2021/2022, 15 academic staff members were involved in the implementation of the study programme - both the elected academic staff of the University, as well as invited guest lecturers, industry professionals, industry experts. In terms of qualifications, 38% of the teaching staff hold a PhD degree.

The share of academic staff in the implementation of the programme is 26,7 %, all of whom have a Master's degree or higher. According to the employees with ViA as the main place of work, (also academic and scientific elected staff, including one ViA PhD student) the share is 53.3%, and additionally one is implementing the programme. The share of industry professionals is 46.7% - practitioners, industry experts.

Among the lecturers there are practitioners-professionals, such as Ģ.Ķesteris, I.Zarembo, with experience in the computer games and VR industry. Also, the Human-Computer Interaction and User Experience (UX) courses are taught by recognised industry professionals, R.Linda, A.Dolmate and L.Lētiņa, whose experience is evidenced by the recognition they have received over many years in the academic and professional IT industry environment. During the study process, students gain insight into the specifics of the industry and the more widely used areas of project management approach, software and applied techniques. We believe that the involvement of industry professionals in the implementation of the study programme adds unique value to the programme, while at the same time creating opportunities for students to learn more up-to-date methods in the industry, to tackle real challenges, thus preparing them for the labour market in the best possible way and acquiring skills and abilities in demand in the labour market.

The elected academic staff of the Master's degree programme consists of three elected professors and associate professors

1. Assoc.prof. Arnis Cīrulis (ViA)
2. Assoc.prof. Kaspars Osis (ViA)
3. Prof. S. Cakula (ViA)

3.4.2. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

There have been no changes in the composition of the teaching staff during the reporting period.

3.4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals or peer-reviewed monographs may be additionally specified. Information on the teaching staff included in the database of experts of the Latvian Council of Science in the relevant field of science (total number, name of the lecturer, field of science in which the teaching staff has the status of an expert and expiration date of the Latvian Council of Science expert) (if applicable).

3.4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

3.4.5. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study programme and study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

Cooperation between teaching staff is facilitated by the inclusion of study courses in modules. In this way, within a module, lecturers work together and promote the integration of the content and objectives of the courses. As a result, the learning experience is logical and interconnected.

The study programme consists of five modules:

- "Planning and Implementation of VR/AR Projects"
- "VR/AR Authoring"
- "User Experience (UX) Design and Implementation"
- "Recognition Services and Intelligent Environments"
- "Sustainability and transformability of VR/AR projects".

The integration between the modules is ensured by the implementation of the courses in a defined sequence and without crossing clear module boundaries. At the same time, the content of the study process is analysed through discussions with students on the complementarity of existing study modules and content, and the findings are discussed with the lecturers of the respective modules. Additional insights for complementing and updating the content and sequencing of modules and courses are identified through discussions with industry in the form of an Advisory Board.

Work on the integration between study modules is ongoing. At the time of submission of the self-

assessment report, the ratio of teaching staff (15 lecturers) to students (10 students) is 0.60.

At the end of the calendar year, all IF faculty members involved in the study programmes have the opportunity to participate in a meeting of the Engineering Faculty Council, during which the programme directors report on current developments, student evaluations and challenges in programme implementation. During the implementation of the study process, the programme director regularly contacts the faculty members involved in the programme in order to clarify the necessary improvements and inform about other current developments of the study programme.

Annexes

III - Description of the Study Programme - 3.1. Indicators Describing the Study Programme		
Sample of the diploma and its supplement to be issued for completing the study programme	48P_VRVT_Diploma-paraugs_Diploma-example-red-corr.zip	48P_VRVT_Diploma-paraugs_Diploma-example-red-corr.zip
For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions (if applicable)		
Compliance of the joint study programme with the provisions of the Law on Higher Education Institutions (table) (if applicable)		
Statistics on the students in the reporting period	2P-Studentu-statistika-2013-2022-AIKA-visi-StudentStatistics-corr.xlsx	2P-Studentu-statistika-2013-2022-AIKA-visi-StudentStatistics-corr.xlsx
III - Description of the Study Programme - 3.2. The Content of Studies and Implementation Thereof		
Compliance with the study programme with the State Education Standard	49P_VR atbilstiba valsts standartam_Compliance_LV_Eng-red-corr.docx	49P_VR atbilstiba valsts standartam_Compliance_LV_Eng-red-corr.docx
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard or the requirements for professional qualification (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	52P_VRVT kartejums_mapping.xls	52P_VRVT kartejums_mapping.xls
The curriculum of the study programme (for each type and form of the implementation of the study programme)	50P_VRVT_plans_2022-2023_LV_Eng-red-corr.xlsx	50P_VRVT_plans_2022-2023_LV_Eng-red-corr.xlsx
Descriptions of the study courses/ modules	51P_VRVT_Kursa apraksti-Course Descriptions.zip	51P_VRVT_Kursa apraksti-Course Descriptions.zip
Description of the organisation of the internship of the students (if applicable)	61P_Internship_IF_students_ENG.docx	61P_Prakšu_nolikums_IF_studentiem.docx
III - Description of the Study Programme - 3.4. Teaching Staff		
Confirmation that the academic staff of the doctoral study programme includes not less than five doctors, of which at least three are experts approved by the Latvian Council of Science in the branch or sub-branch of science in which the study programme intends to award a scientific degree (if applicable)		
Confirmation that the academic staff of the academic study programme complies with the requirements specified in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions (if applicable)		

Information Technologies (42484)

Study field	*Information Technology, Computer Hardware, Electronics, Telecommunications, Computer Management, and Computer Science*
ProcedureStudyProgram.Name	*Information Technologies*
Education classification code	*42484*
Type of the study programme	*Professional bachelor study programme*
Name of the study programme director	*Inese*
Surname of the study programme director	*Džarcāne*
E-mail of the study programme director	*inese.dzarcane@va.lv*
Title of the study programme director	*Mg.sc.soc.*
Phone of the study programme director	*+371 29559788*
Goal of the study programme	*To train highly qualified specialists - software engineers for professional activity in the field of information technologies, whose practical and theoretical knowledge, skills and abilities meet the requirements of the modern labour market, with an emphasis on the acquisition of applied knowledge, which is implemented through projects, research projects and diploma theses, practical classes and apprenticeships.*
Tasks of the study programme	*- To provide students with practice-oriented higher professional education in the fields represented by the field of study;* *- To ensure a study process that meets the requirements of the legislation, the labour market and a student-centred approach to higher education;* *- To develop students' scientific research skills, to create motivation for further education and to encourage students' further self-education;* *- Ensure the development of diverse personal skills;* *- To create an adaptable training offer for companies and their employees in the field of study specialisations.*

Results of the study programme	*KNOWLEDGE:* *1. knowledge at the level of understanding: software development principles and processes, software operating principles and technical parameters, software architecture, software engineering, entity relationship models, software development methods and technologies, programming methods, testing process methodology, software quality standards, software code debugging methods, test automation methods;* *2. knowledge at application level: Computer applications and information technologies, Information retrieval and processing methods, Data structures, Algorithm notation and development methods, Algorithm notation types and methods, Unified Modelling Language (UML) diagrams, Requirements analysis in system development, Knowledge extraction methods, Information processing and visualisation methods;* *3. knowledge at application level: Software development tools, Programming languages and technologies, Use of version control systems, Mathematical foundations of computer science, Database technologies, Software documentation, Software code configuration management and debugging methods, Testing tools, Software testing methods and standards, Software development and project documentation standards;* *SKILLS:* *4. use information technology industry terms and standards, use different operating systems and applications, software development tools and environments, and select the most optimal technology for a given problem domain, apply design schemes and diagrams, and perform system design by developing appropriate documentation;* *5. participate in the management of information systems development projects, as well as in the management of a team of programmers, work as part of a team and independently plan and prioritise work, prepare business documents, observe the principles of professional ethics and labour protection requirements;* *6.develop, test, debug and correct software solutions in accordance with appropriate technology choices;* *COMPETENCIES:* *7. ability to plan a software project, forecasting the workload and time of the task in a team and individually, ability to design a software solution and prepare appropriate documentation, designing the software architecture and user interface, analysing different alternative technical solutions;* *8. ability to read and analyse algorithm descriptions and pseudocode and put them into practice in software, determine the most appropriate algorithm according to the needs and available resources, be familiar with the software design, analysis and planning phases;* *9. the ability to develop (code), test and debug software according to the requirements specification and design description, using modern software development tools and environments, the ability to participate in the implementation of software development projects, participating in discussions on the progress of the project, developing programming guidelines;* *10. the ability to implement and maintain software by understanding the documentation and code of the system to be maintained, handling change requests and problem reports, performing change impact analysis, performing configuration management of the software to be maintained, advising users on the use of the software, and developing appropriate user documentation.*
Final examination upon the completion of the study programme	*Bachelor's Thesis*

Study programme forms

Full time studies - 4 years - latvian

Study type and form	*Full time studies*
Duration in full years	*4*
Duration in month	*0*
Language	*latvian*
Amount (CP)	*160*
Admission requirements (in English)	*Secondary education*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Professional bachelor's degree in information technology*
Qualification to be obtained (in english)	*Software Engineer*

Places of implementation

Place name	City	Address
Vidzeme University of Applied Sciences	VALMIERA	CĒSU IELA 4, VALMIERA, VALMIERAS NOVADS, LV-4201

Part time extramural studies - 5 years - latvian

Study type and form	*Part time extramural studies*
Duration in full years	*5*
Duration in month	*0*
Language	*latvian*
Amount (CP)	*160*
Admission requirements (in English)	*Secondary education*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Professional bachelor's degree in information technology*
Qualification to be obtained (in english)	*Software Engineer*

Places of implementation

Place name	City	Address
Vidzeme University of Applied Sciences	VALMIERA	CĒSU IELA 4, VALMIERA, VALMIERAS NOVADS, LV-4201

Full time studies - 4 years - english

Study type and form	*Full time studies*
Duration in full years	*4*
Duration in month	*0*
Language	*english*
Amount (CP)	*160*
Admission requirements (in English)	*Secondary education; Level of English language proficiency at least at B2 level*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Professional bachelor's degree in information technology*
Qualification to be obtained (in english)	*Software Engineer*

Places of implementation

Place name	City	Address

Vidzeme University of Applied Sciences	VALMIERA	CĒSU IELA 4, VALMIERA, VALMIERAS NOVADS, LV-4201

Part time extramural studies - 5 years - english

Study type and form	*Part time extramural studies*
Duration in full years	*5*
Duration in month	*0*
Language	*english*
Amount (CP)	*160*
Admission requirements (in English)	*Secondary education; Level of English language proficiency at least at B2 level*
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	*Professional bachelor's degree in information technology*
Qualification to be obtained (in english)	*Software Engineer*

Places of implementation

Place name	City	Address
Vidzeme University of Applied Sciences	VALMIERA	CĒSU IELA 4, VALMIERA, VALMIERAS NOVADS, LV-4201

3.1. Indicators Describing the Study Programme

3.1.1. Description and analysis of changes in the parameters of the study programme made since the issuance of the previous accreditation form of the study field or issuance of the study programme license, if the study programme is not included on the accreditation form of the study field, including changes planned within the evaluation procedure of the study field evaluation procedure.

To optimise the resources of the study field, a decision was taken to close the IT College programme and to reallocate resources to strengthen the other study programmes of the study field.

In 2020, in preparation for the upcoming accreditation of the programme, the study programme was improved within the framework of the “Urban Innovative Actions” of the initiative, “Next Generation Micro Cities of Europe”. Considering the rapid development of technologies and international environment in which IT specialists work, new study courses were added to the programme, as well as specialization in cybersecurity and virtual reality was included, and the programme was adjusted to be taught also in English by adapting the existing study courses and introducing new ones, thus the programme was made available to prospective students both from Latvia and abroad.

As part of the initiative, the content of the programme was improved and updated, modern learning methods were introduced (active learning approach), and industry representatives were more involved in the teaching process from companies such as TDL School, Exonicus, Wunder, Vaimo, EchoSport, Printify, Sungis, Emergn, Rimi Baltic .

Innovative learning methods and technologies which are included in the improved programme help future specialists develop individual qualities required in the labour market: creativity, leadership, critical thinking and the ability to make decisions, communication and teamwork skills, the ability to cooperate, to understand the needs and to be able to talk about them.

The following changes were made to the study programme:

New study courses:

- Geo-information systems (GIS) 2CP
- Physics for speciality 4 CP
- Introduction to Python programming and data exploration 2 CP
- Python OOP and modelling 2 CP
- Life cycle of software implementation and maintenance, and process automation 4 CP
- Industrial psychology 2 CP
- Internet of things and sensor networks 2 CP
- JavaScript programming 2 CP

Specialization in cybersecurity and virtual reality
Specialization courses in cybersecurity (16 CP):
• Introduction to cybersecurity 2 CP
• Applied cryptography I, II 4 CP
• Introduction to AI and machine learning 2CP
• Introduction to data science 4 CP
• Data protection and security 4 CP

Specialization courses in VR (16 CP):
• Basic principles of user interface (UX) 2 CP
• Mobile solutions (Android) I, II 4 CP
• 3D modelling using Blender 4 CP
• iOS mobile application design 2 CP
• Design of 3D interactive environment 4 CP

Courses removed from the programme
• Fundamentals of electrical engineering
• Application software
• Logic programming
• Software designing tools and environments
• Programming II
• Graphic programming
• Introductory internship

Changes in the scope of internship1;
The scope of specialization internship is increased from 12 CP to 14 CP
The total scope of internship has been reduced from 26 CP to 22 CP

Organization of study materials has been improved by using Moodle as the primary storage site of study materials; MS Teams is actively used to ensure the study process – both as a communication channel with students and also as a platform for providing online lectures. Also, during the reporting period, technical provision of the laboratories was enhanced and expanded.

The programme is unique also due to cooperation and integration possibilities with other ViA study programmes, which represent a unique combination of studies in Latvia and promote technological literacy in the following areas:

- IT and engineering: platforms, instruments, tools;
- Security;
- Models/modelling;
- Mechatronics.

3.1.2. Analysis and assessment of the study programme compliance with the study field. Analysis of the interrelation between the code of the study programme, the degree, professional qualification/professional qualification requirements or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements. Description of the duration and scope of the implementation of the study programme (including different options of the study programme implementation) and evaluation of its usefulness.

The Professional Bachelor's study programme "Information Technologies" corresponds most closely to the field of study as it provides study courses for the Professional Bachelor's degree in Information Technologies. The title of the study programme corresponds to the aim and content of the study programme - students acquire the knowledge, skills and abilities necessary for a software engineer.

The degree to be obtained corresponds to the content of the study programme - upon graduation from the programme, a Professional Bachelor's Degree in Information Technology and a qualification as a software engineer are awarded.

The aim of the study programme is to prepare qualified specialists - software engineers, for professional activity in the field of information technologies, whose practical and theoretical knowledge, skills and abilities meet the requirements of the modern labour market. The Bachelor's programme focuses on the acquisition of applied knowledge through projects, research projects and dissertations, practical classes and internships.

Applicants who have obtained secondary education are admitted to the study programme “Information Technologies” offered by Vidzeme University of Applied Sciences. Upon applying to the programme, results of the centralized examinations (CE), as well as the average grade in mathematics/algebra/geometry, informatics/applied informatics and one subject of the natural sciences are taken into account. Understanding of the subjects of exact sciences is necessary for successful acquiring of the educational content. Taking into account the upcoming changes in the Cabinet of Ministers Regulation No 846 "Regulations on Requirements, Criteria and Procedures for Admission to Study Programmes", starting from the academic year 2023/2024, the basic criterion for admission requirements will be all CEs passed by the student, with the possibility to obtain additional points for passing a higher level CE in programming or mathematics.

The goal of the study programme is to prepare highly qualified specialists – programming engineers – for professional activity in the information technology sector, whose practical and theoretical knowledge, skills and abilities meet the requirements of the modern labour market. The Bachelor’s programme emphasises the acquisition of applied knowledge through projects, research and diploma papers, practical classes and internship.

Within the programme, students can specialize in two directions: “Cybersecurity and programming” and “Design of virtual reality and mobile systems”. The choice of specialization was determined by the demand of the industry, as well as by the development perspective in the future. Both specializations contribute to the acquisition of competitive knowledge and skills. This is confirmed by information technology industry companies, stating that ViA students and graduates are demanded specialists in the labour market.

The Bachelor’s study programme “Information Technologies” is implemented in two study modes: full-time studies and part-time studies. Although the content of the programme is the same for both study modes, duration of the programme, the amount of individual work and the number of CPs to be acquired per semester differ.

Duration of the full-time studies is four years or 8 semesters of which six semesters are intended for learning the educational content, while the remaining two semesters are intended for mandatory internships, part C courses and writing of a Bachelor’s paper. It is necessary to take courses in the amount of 20 CP per semester in the full-time study mode.

Duration of the part-time studies is 5 years or 10 semesters. Unlike the full-time students, part-time students have a higher proportion of individual work because lectures are held once every three weeks on Saturdays, and the total number of credits to be obtained per semester is 16 CP.

During the 5th and 6th semesters (for full-time students) and the 6th, 7th and 8th semesters (for part-time students), students are required to choose one of the specialisations "Cyber Security and Programming" or "Virtual Reality and Mobile Systems Development" and to take 16 CP courses in the chosen specialisation. The choice of specialisations was determined by the demand in the sector and the future development prospects. Both specialisations contribute to the acquisition of competitive knowledge and skills. This is confirmed by companies in the information technology sector, indicating that VIA students and graduates are in demand on the labour market.

If a full-time study mode is mostly chosen by young people after graduating from school, then part-time study mode is primarily chosen by working students for whom it is important to combine professional activity with the process of obtaining education. Therefore, remote studies with a couple of face-to-face classes per semester would be the most suitable form of completion of education for part-time students. These students have a clear motivation and do not need to network with fellow students or engage in additional activities – their main goal is to acquire knowledge and education. Such an approach would make it possible to attract to the programme students from more distant regions of Latvia, as well as students from abroad.

The quality of the Bachelor's programme "Information Technologies" implemented by ViA is also confirmed by the participation of ViA students in the graduation paper competitions in the field of IT such as "ZIBIT". In 2020, Dāvis Ābols, a graduate of ViA, won the third place in the ZIBIT competition in the Master's paper category with his paper "Design of Virtual Reality Solution for Improving Torso Stability and Cognitive Abilities". Furthermore, ViA graduate Dāvids Markovs won the audience award in 2020 in the category of Bachelor's papers, while ViA graduate Dāvis Ābols won the audience award in the category of Master's papers.

The study programme corresponds to the study field and its main strategic goal – to prepare qualified specialists in the areas represented by the study field who are able to work for companies, organizations, public and municipal institutions, and who are able to perform tasks related to the profession and are ready to continuously improve their knowledge and skills in a changing environment.

Refer to the annex for the Sample of the diploma and its supplement to be issued for mastering the study program (see Annex 55).

3.1.3. Economic and/ or social substantiation of the study programme, analysis of graduates' employment.

As the use of digital technologies has increased, the need for highly qualified IT specialists also has grown. At the time of preparing of the self-assessment report, 879 vacancies are available in the area of Information Technologies on the largest Latvian vacancies portal – www.cv.lv. It is the largest number of vacancies on the portal.

Likewise, the study on the Latvian labour market forecasts for 2040 prepared by the Ministry of Economics points out the growing demand for highly qualified workforce which is educated in the subjects of exact sciences and information technologies due to the increase in the use of technology in everyday life and digitization processes. In accordance with research forecasts, it is estimated that the shortage of specialists in the STEM directions may reach as many as 14,000 by

2027.

Furthermore, the estimates of the World Economic Forum show that in 2025 one of the most demanded professions will be data science, the ability to work with artificial intelligence systems and cloud computing services.

The CSB data show that around 700 young specialists in the field of Information Technologies graduate from higher education institutions in Latvia every year, however, this number is insufficient to cover the market demand for highly qualified IT specialists.

Thus, students of the Bachelor's programme "Information Technologies" are already involved in the labour market during their studies (on average in their third year of studies) and most of them continue working in the industry even after graduation from ViA.

Involvement of graduates in filling out surveys after graduation can be described as poor – 29 graduates have filled out surveys in the reporting period. All are employed in the IT sector, mainly in the private sector.

Information about involvement of students/graduates in the labour market is also obtained from the senior student internship defence meetings, conversations with graduates, therefore it can be said that employment of graduates of the study programme in the industry is over 90%.

3.1.4. Statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down into different study forms, types, and languages.

During the reporting period, 580 students were admitted to the study programme; the proportion of the admitted students to the total number of students admitted to ViA is on average 24.5% – almost a quarter of the students admitted to ViA study in the Bachelor's programme "Information Technologies". The dynamics of the number of admitted students is shown in the table.

Table No.15. *The number of students in the programme, 2014-2022*

	Admitted to the programme	% vs total number of students admitted to ViA	Number of students per programme (as of 01.10)	Number of graduates
2014	58	21	184	34
2015	55	21	176	21
2016	46	17	167	24

2017	51	20	172	28
2018	56	18	151	28
2019	72	27	182	17
2020	85	30	217	16
2021	70	30	206	23
2022	87	37	232	20
Total	**580**			**211**

The largest increase in the number of students can be observed in the last three years. The Covid-19 pandemic and the restrictions that followed, including the transition to remote studies, have both contributed to the increase in the number of students and have also been the reason for dropping out. For part of the students, remote studies enabled them to more successfully combine their professional work with their studies, thus far more students (especially in the part-time programme) started their studies during the remote learning period; this factor was one of the determining factors for the nationals of the Republic of Latvia living abroad (Germany, Denmark, Norway) to start their studies.

During the reporting period, 85% of those studying in the Bachelor's programme "Information Technologies" are male students, while the proportion of female students is 15%.

75% of students chose a full-time study mode, 81% of them had State budget funded study places, while 19% paid tuition fee.

There are no State budget funded study places in the part-time study programme, students themselves pay tuition fee; the proportion of male students also dominates in the part-time study programme – only 14% of the total number of students in the part-time programme are female students, 86% of them are male students.

In order to increase the number of female students in the programme, it is planned to participate more actively in educational campaigns with the aim of encouraging women to study and work in the IT sector.

In recent years, students who want to do retraining (both male and female students) have started their studies in a full-time programme – these students have already degree and professional experience in another discipline, however currently they want to change their profession and qualify for work in the IT sector – this is a positive trend, which should be positioned much more actively in the region.

Considering regional distribution of students, more than half of the students, or 63%, come from Vidzeme region – Valmiera, Cēsis, Limbaži, Sigulda, Smiltene. It is followed by Pierīga with 20% of students, of which 72% live in Riga. The remaining 17% of students are from other places: 10% – from Latgale, 4% – from Zemgale, 3% – from Kurzeme. The low proportion of students from

Kurzeme and Zemgale can be explained by the fact that both regions have higher education institutions that offer IT programmes, thus covering the IT study segment in the regions.

Study breaks/dropout

The average dropout in the reporting period was 6.7% of the total number of students. Analyzing student dropout in the reporting period, the highest rate of dropout is usually in the first year, when one part of the students come to a conclusion that they have chosen the wrong programme, the other part of the dropouts has difficulties with learning STEM subjects. For some students professional activity (a job found in the IT sector) also is a reason for dropping out, as all their focus and attention is devoted to their professional activities.

The highest dropout rate was observed in 2021 reaching 9.9% of the total number of students. This could be due to the increasing professional workload of working students, who, as a result of the restrictions imposed by Covid-19, had a significantly increased workload and less time for studies. Under such conditions, students usually make a choice in favour of a professional career. The second important dropout factor results from the first one – as the workload increases, many working students complained about burnout at workplaces, apathy and mental problems, which prevented them from focusing qualitatively on the study process.

Although Vidzeme University of Applied Sciences was one of the leaders in the higher education institution segment in terms of vaccination against Covid-19, some students were not allowed to continue their studies due to the national vaccination policy that required having a Covid-19 certificate to attend face-to-face lectures.

Steps taken to increase the number of students

Student attraction events are planned and organized throughout the year, starting with school visits and informing teachers about the programmes offered by ViA, up to various activities and events organized by ViA – participation in the educational exhibition SKOLA, pupil involvement in ViA events and open lectures, Researchers' Night at ViA, events organized by the EUDRES consortium, as well as the opportunity for anyone interested to attend lecture courses offered by the Open University.

Information about the study programmes and study environment offered by ViA is often passed on from person to person – this is evidenced by the first-year student survey at the beginning of the academic year of 2022/2023, in which the most frequently mentioned answers were – 'recommended by friends who are studying in this programme' and 'recommended by the study programme graduates'.

Refer to the annex for student number dynamics during the assessment period (see Annex 2).

3.1.5. Substantiation of the development of the joint study programme and description and evaluation of the choice of partner universities, including information on the development and implementation of the joint study programme (if applicable).

3.2. The Content of Studies and Implementation Thereof

3.2.1. Analysis of the content of the study programme. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators with the aims of the study course/ module and the aims and intended outcomes of the study programme. Assessment of the relevance of the content of the study courses/ modules and compliance with the needs of the relevant industry, labour market and with the trends in science on how and whether the content of the study courses/ modules is updated in line with the development trends of the relevant industry, labour market, and science.

The study programme “Information Technologies” offered by ViA has been developed in cooperation with specialists of leading companies in the industry; every year the content of the study courses is supplemented/updated in accordance with the development trends of the industry, based on the recommendations of lecturers, visiting lecturers, members of the Advisory Council and the State Examination Commission, as well as taking into account student suggestions and course surveys.

Within the study programme, the following is acquired: programming languages, software engineering, software development technologies, object-oriented programming, data structures and algorithms, web technologies, software development project management, labour safety, civil and environmental protection, operating system Windows, computer architecture, Linux server administration, database technologies, data transmission networks, testing, project management in IT companies, law and standards of the IT industry, English language, mathematics, economics and business, communication and professional ethics, as well as specialized subjects in the chosen specialization – virtual reality and smart technologies and cybersecurity engineering. Furthermore, students acquire common skills of the IT industry, specific skills of a programming engineering, communication and teamwork skills, and general skills/abilities.

Graduates from the programme are able to undertake the duties defined in the standard of this profession – to develop software in accordance with the conditions of functionality, quality and resource intensity; to implement and maintain software and to give advise to its users; to prepare an environment for software implementation, as well as to prepare test plans and make the necessary changes to software, to plan software projects, to specify requirements and to prepare the necessary user documentation; as well as to lead and organize a working group of information systems development programmers.

The knowledge acquired in the Bachelor’s programme “Information Technologies” is adequate for work in positions such as a programmer, an IT project manager, a system analyst, a tester, a mobile solution programmer, a virtual reality specialist, a programmer of secure systems.

According to the Cabinet Regulations No 512 "Regulations on the National Standard for Second Level Professional Higher Education" issued on 26 August 2014, which determine the minimum number of study works in the programme - "Paragraph 14. During the bachelor's programme, students shall develop and defend at least three study papers", during the IT bachelor's programme at VIA, students shall develop study papers in the following courses: Basics of programming I, II, Web technologies, Basic principles of database system integration, Life cycle of software implementation and maintenance, and process automation, Internet of things, Annual project, Labour safety, environmental and civil protection, Research development and presentation skills.

Learning outcomes of the study programme:

KNOWLEDGE

- Knowledge at the level of understanding: software development principles and processes, software operating principles and technical parameters, software architecture, software engineering, entity relationship models, software development methods and technologies, programming methods, testing process methodology, software quality standards, software code debugging methods, methods of automation testing;
- Knowledge at the level of application: computer application software and information technologies, information search and processing methods, data structures, algorithm writing and development methods, algorithm writing types and methods, Unified Modelling Language (UML) diagrams, requirement analysis in the system development process, knowledge acquisition methods, information processing and visualization methods;
- Knowledge at the level of application: software development tools, programming languages and technologies, use of version control systems, mathematical foundations of computer science, database technologies, preparation of software documentation, software code configuration management and debugging methods, testing tools, software testing methods and standards, software development and project documentation standards.

SKILLS:

- To use terminology and standards of the information technology industry, to use different operating systems and application software, software development tools and environments, to choose the most optimal technology in accordance with the given problem area, to apply design schemes and diagrams, as well as to perform system designing by preparing appropriate documentation;
- To participate in the management of information system development projects and in the management of the working group of programmers, to work in a team, as well as to perform work independently by planning the tasks to be performed and setting priorities, to draw up business documents, to comply with the principles of professional ethics and labour safety requirements;
- To develop software solutions, to perform testing, to correct errors in accordance with the adequately selected technology solutions.

COMPETENCES:

- The ability to plan a software project, predicting workload and time for work task execution when it is performed by a work group and individually, the ability to design a software solution and to prepare proper documentation, developing software architecture and user interface, analyzing various alternative technical solutions;
- The ability to read and analyze algorithm descriptions and a pseudo-code and to operate with them when developing software, to determine the most suitable algorithm in accordance with the needs and available resources, to know stages of software design, analysis and planning;
- The ability to develop (to code), test and debug software in accordance with the requirement specifications and design description, using modern software development tools and environments, the ability to participate in the implementation of software development projects, participating in the discussion of project progress, developing programming guidelines;
- The ability to implement and maintain software, understanding the documentation and code of the system to be maintained, handling change requests and problem reports, performing change impact analysis, managing the configuration of software to be maintained, to give advise to software users as they use it, as well as to prepare appropriate user

documentation.

A more detailed mapping of the objectives and outcomes of the study courses is provided in the programme mapping.

The courses included in the study programme contribute to the development of the skills, competences and competences specified as study programme outcomes. For example, the ability to plan a software project and prepare appropriate documentation is included in 20 courses. The ability to read and analyse algorithm descriptions and pseudocode and put them into practice in software, to determine the most appropriate algorithm according to the needs and available resources, to be familiar with the stages of software design, analysis and planning are included in 22 study courses.

All the achievable results of the study programme are reflected in the Annual Project Papers written by students, as well as in the Bachelor's Theses - in order to be able to defend them qualitatively, the student must apply the knowledge, skills and competences acquired in the study courses.

The updating of the study course content according to the industry and labour market trends is implemented through the programme lecturers - professionals working in the industry. These lecturers bring the latest developments in the industry into the courses, informing students about the latest trends, software applications, various project management methods and other current developments. This way, students are already up-to-date with current industry information during their studies and are better prepared to start their careers in the industry. Academic staff of the programme improve their knowledge by attending specialised conferences and subsequently incorporating what they hear in their courses, if it is relevant to the objectives of the course, as well as by actively participating in scientific and research activities.

In the framework of the project "Next Generation Micro Cities of Europe", an evaluation of the content of the study programme and its relevance to current developments in the field was carried out. The content of the programme was reviewed and analysed by a team of lecturers together with representatives of companies in the sector, assessing its relevance to industry requirements/needs and current trends. As a result of the evaluation, the content of the study programme was improved and refined by including new study courses, specialisation courses in Cyber Security and Virtual Reality, updating existing ones, as well as changing lecturers in some study courses

Replacement of study courses and inclusion of new study courses in the programme has contributed to the improvement of the quality of the study programme - the programme has become more diverse, as evidenced by the feedback provided by students in the end-of-semester talks, indicating that they feel more knowledgeable in the use of technology in their internships/workplaces than those enrolled in other Latvian HEIs.

Refer to the annex for Informative report on the compliance of the study program with the state education standard (see Annex 56).

Refer to the annex for Informative report on the compliance of the qualification obtained in the study program with the professional standard (see Annex 57).

Refer to the annex for Study program plan (see Annex 58).

Refer to the annex for Descriptions of study courses of the study program (see Annex 59).

Refer to the annex for Mapping of study courses to achieve the study results of the study program (see Annex 60).

3.2.2. In the case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation. In the case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels (if applicable).

3.2.3. Assessment of the study programme including the study course/ module implementation methods by indicating what the methods are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. In the case of a joint study programme, or in case the study programme is implemented in a foreign language or in the form of distance learning, describe in detail the methods used to deliver such a study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

Academic obligations of the student and their fulfilment requirements within a specific study course are laid down in the course description. The course description is written by the lecturer in accordance with the guidelines approved by the vice-rector for academic and scientific affairs.

Courses are organized in accordance with the regulatory enactments and the high standards established by ViA.

The educational content of the programme is acquired by practicing both passive and active forms of study. Students acquire theoretical knowledge be means of lectures, seminars and independent literature studies.

In 2020, active learning classrooms (ALCs) were set up within the framework of the initiative "Urban Innovative Actions" of the project "Next Generation Micro Cities of Europe", which are suitable for the use of active learning approach methods, face-to-face and remote group work, and they are equipped with the latest technologies and software. The layout provides for convenient adjustment of the room in accordance with the study needs and for different size and format group work; the rooms are suitable for students and their needs and are equipped with the necessary technologies. They feature large desks and movable chairs designed to facilitate and promote active learning.

Upon teaching individual courses, lecturers use the PBL (project based learning) method in combination with ALC. PBL is a method by help of which students acquire knowledge and skills by engaging in real and meaningful projects. ALC-PBL's main goal is to promote innovation and knowledge transfer. Through this approach, students gain real work experience in cooperation with real companies, as well as strengthen personal cooperation abilities, goal orientation, and other valuable experiences that cannot be obtained in the daily learning process.

Innovative learning methods and technologies as part of the improved programme help future specialists develop individual qualities required in the labour market: creativity, leadership, critical thinking and the ability to take decisions, communication skills, the ability to cooperate and teamwork skills, the ability to understand needs and be able to talk about them.

Practical skills necessary for a programming engineer are developed and improved under the guidance of experienced IT industry specialists by means of laboratory works, practical classes, field trips, and internships at industry companies. The involvement of SIA TDL School in teaching the testing course can be mentioned as a successful example of cooperation between the industry and ViA.

Course projects and research papers are written within the framework of the courses. Their purpose is to assess students' knowledge and skills in the relevant course, as well as to develop skills to substantiate their own opinion. The course project must address a specific problem. A student individually or in a group chooses a topic of the course project, which must be approved by the supervisor. Independent research conducted by students is an important part of the study process.

At the end of the second study year, students write an annual project – it must demonstrate their ability and skills to integrate theoretical and practical knowledge acquired in previous study courses, skills and abilities acquired in the study process, use them in practical research, develop recommendations to implement research results in practice.

At the end of each study course, students take a written or oral examination and/or write a research paper, which must demonstrate theoretical knowledge acquired in the study course, the ability and skills to systematize it and use it in research projects.

A Bachelor's paper is a result of independent research conducted by a student bringing together theoretical knowledge acquired in various study courses. Based on this knowledge, students conduct practical research.

Due to restrictions caused by Covid-19, lectures were organized in an online format using Webex / MS Teams or Zoom platforms. As there were no face-to-face classes, student feedback was especially important for the teaching staff to make sure students have learned/understood the material covered in classes. Remote consultations were provided to students, some of the lecturers used communication platforms popular among young people, where at the request of the students, they provided additional explanations about the material covered in the lecture – by using communication tools popular among young people, more successful communication was ensured, which resulted in better understanding and acquiring of the material. Students also appreciated the use of such methods.

International students are offered additional consultations to make sure they have acquired the content of the course. International lecturers involved in the implementation of the programme use mainly remote forms of teaching; at the request of students, some lectures are recorded so that students can watch them again if necessary.

Part-time students have a higher proportion of individual work – this study programme is chosen mainly by working students; accordingly, they prefer remote studies, which allow them to more successfully combine their professional and family life with studies at ViA and to acquire the content of the study course in a suitable format.

The information obtained during the end-of-semester discussions shows that the possibility of remote studies is one of the main factors in the choice of a higher education institution for part-time students, and it provides the opportunity for the Latvian nationals abroad to study, so it is planned to further integrate this form of study into the part-time study programme, as it meets the needs of the specific study group and allows them to learn the content of the study programme more successfully.

When teaching part-time students, lecturers adapt the educational content to a few face-to-face classes, focusing more on a summary of the topic. It is expected that students will do a larger

amount of individual work.

Part-time students just like full-time students also write course papers, an annual project and a Bachelor's paper, they have group work, they participate in seminars, do internships. There are no field trips for part-time students, as they study on Saturdays.

The methods used in the study process - practical and group works, laboratory works, active learning methods, and study practices contribute to the achievement of the study course results and study programme objectives - these methods are used to strengthen and apply theoretical knowledge in practice, as well as to acquire the practical skills necessary for a software engineer.

ViA ensures the implementation of the Programmes in such a way that the principles of student-centred education are taken into account in the implementation of the study process and students are encouraged to actively participate in the development of the study process. ViA respects the diversity of students' needs in the study process by choosing learning methods that are appropriate for them. ViA uses innovative pedagogical methods and an individual approach. Study programme directors ensure that lecturers involved in the implementation of the programme are familiar with the methods of assessing learning outcomes and are supported in developing their skills in this area; assessment criteria and methods, as well as the criteria for grading, are made public in advance; assessment provides students with the opportunity to demonstrate the extent to which they have achieved the learning outcomes; students receive feedback from lecturers who, where appropriate, provide advice on the study and research process; assessment is consistent, applied fairly to all students and implemented in accordance with the approved course descriptions. Appropriate procedures are in place to deal with student complaints, which are regulated by the Regulations on Studies and the Regulations on Ethics.

3.2.4. If the study programme envisages an internship, describe the internship opportunities offered to students, provision and work organization, including whether the higher education institution/ college helps students to find an internship place. If the study programme is implemented in a foreign language, provide information on how internship opportunities are provided in a foreign language, including for foreign students. To provide analysis and evaluation of the connection of the tasks set for students during the internship included in the study programme with the learning outcomes of the study programme (if applicable).

During the reporting period, ViA revised and updated the "Internship Regulations and Requirements for Students of the Faculty of Engineering" *(approved at the meeting of the Assembly of the Faculty of Engineering on 13.10.2022)* – the regulations lay down a procedure for organizing, preparing, presenting and defending internship for college, Bachelor's and Master's programme students. As the study programme is open to international students, the internship regulations are also available in English.

The scope of internship was also changed – out of the three initially planned internships – Introductory internship (4 CP), Specialization internship (12 CP) and Pre-diploma internship (8 CP), only two internships – Specialization and Pre-diploma internship – were kept. The amount of specialization internship was increased by 2 CP – from 12 CP to 14 CP; the amount of CP for pre-diploma internship remained the same. Furthermore, the introductory internship which was planned in the 4th semester was removed from the study plan, allowing students to learn the content of the study programme more effectively and to devote time for completing internship in the fourth year

of study.

Internship is an important part of the study programme, the purpose of which is to provide an opportunity for students to get to know the management structure, operating principles of a particular organization and to consolidate theoretical knowledge acquired in the study programme, to improve practical skills needed for specialists in the relevant field, to conduct research at a particular organization, and to develop proposals for improving processes. The knowledge, skills and competences necessary for a specialist in the relevant field are integrated into the content of the internship programme.

The Bachelor's programme "Information Technologies" provides for two internships – both are planned in the last year of study. Specialization internship in the amount of 14 CP is planned in the 7th semester, pre-diploma internship in the amount of 8 CP is planned in the 8th semester. In the part-time study programme, the specialisation internship is scheduled for the 8th semester, while the undergraduate internship is scheduled for the 9th semester.

Duration of the specialization internship is 14 weeks and its purpose is to provide an opportunity for a student to acquire professional skills under the guidance of specialists working in the IT industry and to participate in the work of a real company in accordance with the operational duties of a programming engineer defined in the Occupational Standards.

The objectives of the traineeship are derived from the Software Engineer Occupational Standard (agreed at the meeting of the Tripartite Cooperation Sub-Council for Vocational Education and Employment of 17 June 2009, Minutes No 5) and contribute to the acquisition of practical skills and knowledge necessary for software engineers to prepare them for work in companies in the sector. The tasks of the internship contribute to the achievement of the main strategic goal of the study field - to prepare qualified specialists in the fields represented by the study field for work in enterprises, organisations, state and municipal institutions, who are able to perform tasks related to their profession and are ready to continuously improve their knowledge and skills in a changing environment. It also meets the aim of the programme - to prepare qualified specialists - software engineers, for professional activity in the field of information technologies, whose practical and theoretical knowledge, skills and abilities meet the requirements of the modern labour market.

The link to the Professional Standard is included in the Regulations of the apprenticeship as well as in the Moodle section "Programme information".

According to the Cabinet of Ministers Regulation No. 512 "Regulations on the State Standard for Second Level Professional Higher Education", the internship contract is concluded between VIA and the internship company. The aims, tasks and evaluation procedure of the internship are described in the internship regulations developed by ViA. The rights and responsibilities of the parties are specified in the internship contract.
During the internship students get acquainted with the industry companies and their specifics of work - management structure and operating principles, working methods (Agile, Scrum, Waterfall, kanban, etc.), technologies used, as well as strengthen the specific industry knowledge (related to the profession of software engineer) acquired during the internship. At the end of the internship, the supervisor completes an evaluation questionnaire and provides feedback on the evaluation of the intern's work.

Internship tasks:

- To perform necessary work assignments at the company related to the duties defined in the Occupational Standard for a programming engineer and those duties specified by the internship supervisor at the company
- To get to know the company's information technology system and its use, to analyze the

usefulness and use of information technology at the company;
- To get to know information technology systems used at the company and to practically apply the knowledge acquired in the studies.

Duration of the pre-diploma internship is 8 weeks, during which the student should have the opportunity to participate in the development of a specific project related to the company, as well as in the preparation of all relevant documentation.

Internship tasks:

- To be able to plan a software project, including to get to know software design description standards, to create and describe software architecture, to analyze various technical solutions and to choose the most suitable one;
- To prepare appropriate software project documentation;
- To evaluate and analyze development progress of the software project;
- To manage and organize separate parts of the software development project specified by the internship supervisor at the company.

Tasks of both internships correspond to the courses taught in the study programme and help consolidate theoretical knowledge in practice.

Information on upcoming internship is sent to students in due time, already in the spring semester of the third year, besides, during the end-of-semester discussions, students are reminded to timely start discussions with potential internship providers. In this way, timely feedback is obtained on the number of students who might need support in finding an internship.

Internships for students are offered by public and municipal institutions of the region, production companies and ViA cooperation partners, as well as companies with which ViA does not have cooperation agreements. Information about internships offered is posted on the ViA website; e-mails sent by companies asking to choose an internship with them are also forwarded to students' e-mails – they are mostly external industry companies with which ViA does not have cooperation agreements.

Part of full-time students has already found a job in the IT sector at the time of internship and is completing internship at their existing workplaces. Most students find internships themselves and do not need help in this regard. In most cases, part-time students do internships at their current workplaces, and have not asked for help to find an internship.

The main obstacles to providing an internship in time are as follows: slow intern selection procedures by the companies, delays in replying, as well as the need to perform a personality check if the specifics of the planned work require involvement in international projects with special conditions.

Challenges in providing internships were caused by the Covid-19 pandemic, when companies switched to remote work – a number of companies refused internships to students due to their inability to provide them with face-to-face work and the necessary support.

If the student needs help in finding an internship, the Director of the study programme contacts the cooperation partner companies or regional municipal companies, asking them to consider the possibility of providing internship for students of the programme.

During the reporting period, all students have successfully found internships – both on their own and with the help of the Director of the study programme.

Internship is defended before the internship defence commission, which is established by the Director of the programme. The commission consists of the teaching staff of the programme – both

professional lecturers and representatives of the academic staff of ViA. The internship supervisor evaluates student's performance during internship on a 10-point scale: practical work skills and knowledge acquired by the student during internship; student's attitude towards the fulfilment of duties during internship. The overall assessment of internship consists of 3 components: assessment given by the internship supervisor (25%); internship report (50%); internship defence (25%).

The Self-assessment report annex contains information on the compliance of the study programme with the professional standard. As the existing occupational standard is being revised at the time of writing the report, the annex also contains information on the compliance of the study programme with the new draft occupational standard. This can be found in the Annex under "Draft_EN"

Refer to the annex for the Internship Regulations for IT students (see Annex 61).

3.2.5. Evaluation and description of the promotion opportunities and the promotion process provided to the students of the doctoral study programme (if applicable).

3.2.6. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the marks of the final theses.

From 2013 to 2022, 234 Bachelor's papers were defended within the programme, of which 125 papers, or 53%, got top marks – very good (8), excellent (9), outstanding (10).

Graduation papers that got the highest possible mark – outstanding (10 points) – during the reporting period

Zagreb Green Park Layout Design Simulator
Application of Augmented Reality RFID Technology
The Use of Standard Payment Smart Cards as Additional Key in Web Application User Authentication
Modelling and Visualization of Public Vehicles
Design of 3D Game Prototyping in the Unity Game Engine Using Free and Open Source Tools
Web-Based Spatial Sensor Data Collection System
Active Machine Learning in Regression Equations
Design of Accounting System for Spare Parts of Production Equipment
Application of Radio Frequency Identification Technologies in Beekeeping
Design of Customized Microsoft Active Directory Management and CISCO Firewall Recording Tool

Automated Configuration and Geolocation Visualization with Python Support for Large-Scale Network Equipment
Design of Prototype of Motion Sensor with Object Recognition
Design of Android Mobile Application for Stamp Collectors
Design of Database Reports and Statistical Application in Oracle Application Express Environment
Improving of Geospatial Resource Metadata Structure and Data Management on G/Technology

The average mark of the graduation papers defended during the reporting period was 7.46. Graduation papers of the part-time students got better marks – their average mark is 8.4. This can be explained by the fact that they are more experienced in terms of professionalism and better understand the topic of the chosen paper, as well as they are motivated to successfully complete studies.

The average mark of graduation papers during the reporting period is given in the table No.16.

Table No.16. Average mark of the graduation papers

IT (B)	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Number or papers	20	23	16	18	28	28	24	21	34	22
Papers written by part-time students	2	4	0	0	0	1	1	0	6	5
Average mark	7.7	7.7	7.5	6.8	7.3	7.3	7.8	7.4	7.7	7.4

Upon analyzing graduation paper topics, they can be divided into five thematic groups – the largest ones are as follows: “design of various systems” – 43%, “design of websites, web applications or online stores” – 18%, “design of mobile solutions (apps)” – 13% , “design of computer games” – 8%, various types of mechatronic systems and/or automated systems – 5%. Listed below are some examples of graduation paper topics in each of the above-mentioned thematic group.

Design of various systems:

- Using QR codes for more efficient waste management
- Data backup copy system with built-in data deduplication
- Development of an inventory accounting system
- Development of an accounting system
- Accounting system of HBD controller damages
- Latvian and Estonian forest inventory import tool
- Development of a real-time result processing and distribution system
- Development of a content management system for the amusement park mobile app
- Monitoring and control of the indoor climate

Design of websites, web applications or online stores (18%)

- Production machinery load planning web application
- Website for displaying rally results on mobile devices
- Integration of an interactive map into a web solution
- Design of crowdfunding social network platform in startup conditions

Design of mobile solutions (apps) (13%)

- Design of Android mobile application for stamp collectors
- Design of a mobile application for planning daily trips
- Mobile system for personal travel progress and route recording

Design of computer games (8%)

- Design of the multiplayer game on Unity3d with authoritative client-server communication
- Design of the single player escape game on Unity3D
- Design of the multiplayer mode of the computer game GTA San Andreas
- Visualization of the erudition game “Find yourself in Europe” on the Unity 3D platform
- Design of the prediction game of the Latvian Floorball Union

Mechatronic equipment and/or Automation solutions

- Automation of system administration and maintenance with Windows PowerShell
- Automated sauna control system
- Automation of wooden panel designs
- Automated control system for passenger transport
- Design of a Joomla component for automated data reading
- Web-based spatial sensor data collection system
- Dynamic solar panel system that follows the position of the sun
- Electric tool and inventory accounting system using NFC readers and tags

4% of the papers in the reporting period provided various VR and cybersecurity solutions, for example, “Interactive Visualization of Terrain Using Augmented Reality”, “3D Terrain Model Generation from GIS Data”, “Application of Augmented Reality RFID Technology”, “Chemical Experiment Simulator in Virtual Reality Environment” , “Enterprise Passive Information Collection Tool “ReconRex””, “Design of Customized Microsoft Active Directory Management and CISCO Firewall Recording Tool”, “Active IP Address Search Application”.

3% of the papers in the reporting period were related to artificial intelligence solutions and machine learning, for example, “Processing and Recognition of Facial Images Using Artificial Neural Network”, “Human Body Motion Detection Controller Solution for Anatomy Studies”, “Design of Prototype of Motion Sensor with Object Recognition”.

It should be pointed out that there is a separate group of the graduation papers that are written for the needs of specific companies/institutions, e.g., Valmiera Municipality, Smiltene Municipality, “Straupe” Dairy Cooperative, Vidzeme University of Applied Sciences, Latvian UDHS Association, Latvenergo, tourism agency “Kolumbs”, participants of orienteering competitions, municipal police, National Armed Forces, etc. This group of papers often contain internal systems of the company, some of the papers are not publicly available because the author has indicated that the paper is not intended for public use and viewing.

Refer to the Annex for a list of the Bachelor’s papers defended during the reporting period (see Annex 62).

3.3. Resources and Provision of the Study Programme

3.3.1. Assessment of the compliance of the resources and provision (study provision,

scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples.

Resources available for the programme (including financial resources) and material and technical provision enable to implement the programme qualitatively and are adequate in relation to the content of the programme, as well as allow successful organization of the study process.

For the successful implementation of the study programme the students need to use the computer laboratories, laboratories in the building of the Faculty of Engineering of VIA - their equipment is necessary for practical learning of the study course content in such courses as programming, Java Script programming, etc. Also the computer software purchased within the study direction is necessary for learning of certain study courses, such as Blender, Unity - 3D interactive video development, Eclipse EE - Java programming, WAMP - Web technologies course. They are necessary for the study process and give students the opportunity to learn how to use them in practice.

The literature sources available in the VIA Library are used to acquire theoretical knowledge.

Part II, Section 2.3., paragraphs 2.3.1. to 2.3.3. of the report already provides a detailed list of resources available for the study field. It has to be pointed out that the e-environment where study course materials, course schedules, and other materials are uploaded is actively used in the study process. Opportunities provided by multimedia and virtual learning environment are also used in the classes.

In order to ensure the achievement of learning outcomes of the programme, students are supported by the Director of the programme and the rest of the faculty staff. The support of the administrative and technical staff is sufficient to ensure the achievement of learning outcomes.

3.3.2. Assessment of the study provision and scientific base support, including the resources provided within the framework of cooperation with other science institutes and higher education institutions (applicable to doctoral study programmes) (if applicable).

3.3.3. Indicate data on the available funding for the corresponding study programme, its funding sources and their use for the development of the study programme. Provide information on the costs per one student within this study programme, indicating the items included in the cost calculation and the percentage distribution of funding between the specified items. The minimum number of students in the study programme in order to ensure the profitability of the study programme (indicating separately the information on each language, type and form of the study programme implementation).

ViA does not divide infrastructure by study programmes, resources are assessed for the entire higher education institution as a whole. The base available for the implementation of the IT study

programme (lecture-rooms, computer classes, laboratory, and library resources, computer software) is sufficient.

See Part II, Section 2.3., paragraphs 2.3.1. to 2.3.3. of the report for an extended list of available resources in the field of study.

3.4. Teaching Staff

3.4.1. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

The elected academic staff, as well as visiting lecturers, industry professionals – visiting assistants, visiting lecturers, visiting associate professors, visiting professors – are involved in the implementation of the programme. During the reporting period, the number of teaching staff involved in the implementation of the programme has tripled – from 11 lecturers in 2013 to 40 lecturers in 2022. The growth can be observed in both segments –among academic staff and visiting lecturers.

In the academic year of 2022/2023, the programme was implemented by 12 elected lecturers – six of them are holders of a doctoral degree (1 professor, 2 associate professors, 3 assistant professors) and eight are holders of a Master's degree. There are 28 visiting lecturers involved in the implementation of the programme, four of them are holders of a doctoral degree (two of them are associate professors) and 18 are holders of a Master's degree. It is expected that a doctoral degree will be awarded to one of the visiting lecturers in the academic year of 2022/2023, thereby increasing the number of lecturers involved in the implementation of the programme who are holders of a doctoral degree.

The three courses are taught by guest lecturers from foreign universities in the USA, Romania and the Czech Republic, bringing foreign academic experience, the use of different methods, a broader perspective of the field based on their professional experience, and improving students' English language skills.

17 of the programme's lecturers are industry professionals, all of whom teach mainly industry-specific courses, bringing to them the latest developments in the field, informing students about the latest trends, software applications, various project management techniques and other topical issues. In this way, students are already up-to-date with current industry information during their studies and are better prepared to start their careers in the industry. This is also an aspect that students themselves mention in their end-of-semester discussions as a benefit of having lecturers in the field.

Involvement of graduates in the implementation of the programme contributes to improving the quality of courses and ensuring continuity of the programme – in the academic year of 2021/2022,

10 graduates were involved in the implementation of the programme. All lecturers have the required academic and/or professional qualifications that meet the goals and objectives of the programme.

All lecturers have the necessary academic (higher) education and/or professional qualifications relevant to the aims and objectives of the study programme, e.g, language courses are taught by lecturers with higher education qualifications in philology, pedagogy; lecturers involved in the delivery of specialised courses in the field have higher education qualifications in engineering or computer science; lecturers teaching psychology courses have higher education qualifications in psychology; lecturers teaching legal courses (Industrial Law, Labour, Environmental and Civil Protection) have higher education qualifications in law; lecturers teaching economics courses have higher education qualifications in economics.

ViA has set measures to ensure and verify qualifications and competence of lecturers to provide high-quality education. They are as follows:

- requirements are laid down in ViA Regulations on Elections to Academic Positions;
- ViA Remuneration Regulations contain the division of academic work, conditions for research work;
- Student surveys of each study course taught by the lecturer in the relevant semester of the academic year;
- ViA Senate has approved job descriptions and responsibilities of lecturers, which lay down requirements for academic work, research, academic and scientific qualification improvement and also for administrative work;
- In accordance with the Cabinet Regulations of the Republic of Latvia “Regarding Education and Professional Qualifications Necessary for Teachers and Procedure for Improving the Professional Competence of Teachers”, professional development can include international mobility in accordance with the goals of professional development, participation in projects, conferences and seminars, which is confirmed by the documents issued.

Taking into account the regulatory enactments of VIA, the teaching staff involved in the implementation of study programmes have the appropriate qualifications to participate in the implementation of the programme.

Table No. 14. Lecturers involved in the implementation of the programme

Year	Number	Academic staff	Visiting lecturers	Holders of doctoral degree (%)
2013/2014	11	2	9	36%
2014/2015	26	13	13	38.5%
2015/2016	28	13	15	32%
2016/2017	31	14	17	32%
2017/2018	29	10	19	24%
2018/2019	30	9	21	20%
2019/2020	33	9	24	24%

2020/2021	35	11	24	29%
2021/2022	39	9	30	23%
2022/2023	40	12	28	35%

3.4.2. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

The changes in the composition of teaching staff in the study programme since the last accreditation fluctuate within 30% - this is mainly due to the increasing workload of professionals in the field in their main jobs, which resulted in the discontinuation of teaching in the VIA programme courses. The second reason for the change in the composition of the teaching staff is the quality criteria, which were not met by the lecturers of certain courses, so the decision was taken to discontinue cooperation, or a particular course was replaced by a more relevant (newer technology) course in line with industry trends.

The most significant changes in the composition of the teaching staff were made in the framework of the NextGen project, during which a team of lecturers, together with representatives of companies in the sector, reviewed and analysed the content of the programme, assessing whether it met the requirements/needs and trends of the sector. As a result of the evaluation, the content of the study programme was improved and refined by including new study courses as well as specialisation courses in Cyber Security and Virtual Reality. The introduction of specialisation courses created a need for teaching staff with experience in the delivery of these courses.

For example, the course "Fundamentals of Electrical Engineering" was only replaced by Physics I, II, as the Electrical Engineering course, as a result of the analysis carried out by the lecturers, was considered too narrow, with too much emphasis on electrical engineering, and not relevant for IT students. The new Physics course contains sufficient knowledge of electrical engineering to enable IT professionals to understand its fundamentals and to be able to handle the equipment.

The course "Modelling and Formal Specification" was replaced by a new course "Business Process Analysis and Modelling".

In addition to the specialisation courses, the study programme includes the courses "JavaScript Programming", "Geographic Information Systems", "Introduction to Python Programming" and "Python OOP and UML", "Software Implementation and Maintenance Life Cycle and Process Automation", "Industrial Psychology".

The following courses were withdrawn from the study programme: "Design and Administration of Global Computer Networks", "Accounting/Resource Planning Systems", "Customer Management Systems", "Knowledge Management Systems", as the information contained therein no longer met the requirements of the rapidly growing IT industry.

The replacement of study courses and the inclusion of new study courses in the programme have contributed to the improvement of the quality of the study programme - the programme has

become more diverse, as evidenced by the feedback provided by students in the end-of-semester talks, indicating that they feel more knowledgeable in the use of technology in their internships/workplaces than students enrolled in other Latvian HEIs.

During the last three years, the composition of visiting lecturers has been quite stable; changes among the academic staff are minimal.

The involvement of industry professionals in the programme is essential, as it provides a vision of industry development trends, current events, required skills and abilities that students need to develop to be better prepared for the demands of the labour market.

3.4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals or peer-reviewed monographs may be additionally specified. Information on the teaching staff included in the database of experts of the Latvian Council of Science in the relevant field of science (total number, name of the lecturer, field of science in which the teaching staff has the status of an expert and expiration date of the Latvian Council of Science expert) (if applicable).

3.4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

3.4.5. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study programme and study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

Several activities are carried out within the study programme to foster cooperation between lecturers - one of them is the general faculty meeting, which is convened at the end of each semester and in which all programme lecturers - both elected and guest lecturers - are invited to participate. The main focus of the general meeting is to reflect on the semester and the current issues and challenges of the study programme. The Programme Director reports on current events, student performance, challenges in the programmes. During the General Assembly, participants are invited to give their views on both the processes and the promotion of mutual cooperation.

During the semester, programme lecturers have the opportunity to participate in course hospitalizations and evaluate the work of their colleagues, make recommendations for improving the study process, and share their experience. This opportunity is mainly used by the academic staff of the programme or the elected academic staff of VIA. In most cases, the professionals are familiar with each other in the context of the field and communicate directly.
In addition to the above, the programme leader contacts the programme staff and informs them about current developments in the programme or invites them to share their experience in integrating specific students into the study process.

Due to the Covid-19 pandemic, face-to-face meetings were subject to restrictions, however from 2022, face-to-face end-of-semester discussions with teaching staff will also be resumed in order to share experience in the implementation of study courses, to discuss improvements in course papers in modular courses, such as introducing a uniform course paper with certain tasks for each course of the study module, thus preventing unnecessary study load and homework fragmentation, as well as new study course implementation concepts.

The ratio of the number of teaching staff and students in the academic year of 2022/2023 is 1:6

Annexes

III - Description of the Study Programme - 3.1. Indicators Describing the Study Programme		
Sample of the diploma and its supplement to be issued for completing the study programme	55P_IT_Diploma-paraugs_Diploma-example-red.zip	55P_IT_Diploma-paraugs_Diploma-example-red.zip
For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions (if applicable)		
Compliance of the joint study programme with the provisions of the Law on Higher Education Institutions (table) (if applicable)		
Statistics on the students in the reporting period	2P-Studentu-statistika-2013-2022-AIKA-visi-StudentStatistics-corr.xlsx	2P-Studentu-statistika-2013-2022-AIKA-visi-StudentStatistics-corr.xlsx
III - Description of the Study Programme - 3.2. The Content of Studies and Implementation Thereof		
Compliance with the study programme with the State Education Standard	56P_IT atbilstība izgl.stand._LV_Compliance to edu.stand.ENG-red-corr.doc	56P_IT atbilstība izgl.stand._LV_Compliance to edu.stand.ENG-red-corr.doc
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard or the requirements for professional qualification (if applicable)	57P_IT atbilstiba prof.stand.-red_Compliance to prof.stand.-corr.xls	57P_IT atbilstiba prof.stand.-red_Compliance to prof.stand.-corr.xls
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	60P_IT_Kartejums_Mapping-red-corr.xls	60P_IT_Kartejums_Mapping-red-corr.xls
The curriculum of the study programme (for each type and form of the implementation of the study programme)	58P_IT_Studiju programma_LV_Study plan_ENG_red-corr.xlsx	58P_IT_Studiju programma_LV_Study plan_ENG_red-corr.xlsx
Descriptions of the study courses/ modules	59P_IT_Kursu apraksti_Course Descriptions.zip	59P_IT_Kursu apraksti_Course Descriptions.zip
Description of the organisation of the internship of the students (if applicable)	61P_Internship_IF_students_ENG.docx	61P_Prakšu_nolikums_IF_studentiem.docx
III - Description of the Study Programme - 3.4. Teaching Staff		
Confirmation that the academic staff of the doctoral study programme includes not less than five doctors, of which at least three are experts approved by the Latvian Council of Science in the branch or sub-branch of science in which the study programme intends to award a scientific degree (if applicable)		
Confirmation that the academic staff of the academic study programme complies with the requirements specified in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions (if applicable)		