



**STUDIJŲ KOKYBĖS VERTINIMO CENTRAS  
CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION**

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## **SOFTWARE ENGINEERING FIELD OF STUDY**

### **OVERVIEW REPORT**

**Prepared by the chairpersons of the Software Engineering field of study expert panels:**

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# I. INTRODUCTION

Overview report is based on the external evaluation of the Software Engineering field of study in the following Lithuanian Higher Education Institutions (HEIs):

- Kaunas University of Technology (KTU)
- Kauno kolegija (KAUKO)
- SMK Aukštoji mokykla (SMK)
- Šiaulių valstybinė kolegija (ŠVK)
- Vilnius Gediminas Technical University (Vilnius TECH)
- Vilniaus kolegija (VIKO)
- Vilnius University (VU)

The external evaluation was organised by the Centre for Quality Assessment in Higher Education (SKVC), Lithuania.

This Overview report focuses on the main findings of the external evaluation of the field of study from a general point of view. External evaluation reports containing more detailed information on the field of study in the relevant HEIs, including evaluation points, commendations, and recommendations, are available on SKVC's website.

Based on the findings of the evaluation, the decision has been made to give a positive evaluation to the following HEIs and cycles:

- Kaunas University of Technology, I cycle, II cycle
- Kauno kolegija, I cycle
- SMK Aukštoji mokykla, Short cycle, I cycle
- Šiaulių valstybinė kolegija, I cycle
- Vilnius Gediminas Technical University, I cycle
- Vilniaus kolegija, Short cycle, I cycle
- Vilnius University, I cycle, II cycle

Upon receiving a positive evaluation, SKVC decides to either grant full accreditation to the field of study and cycle for a period of 7 years or provide partial accreditation for a period of 3 years. If the field of study and cycle is given negative evaluation, it is not accredited.

## **II. OVERVIEW BY EVALUATION AREAS**

This section of the Overview report highlights the overarching observations made by the expert panels regarding the positive aspects of the Software Engineering field of study in Lithuanian HEIs, as well as areas identified for improvement.

### **1. STUDY AIMS, LEARNING OUTCOMES AND CURRICULUM**

The evaluated programmes strongly reflect current societal demands and labor market trends, effectively addressing contemporary and future-oriented technologies such as artificial intelligence (AI), Internet of Things (IoT), cybersecurity, multimedia technologies, software development, and software testing. SMK and ŠVK are particularly notable for their innovative curricula, integrating advanced technological trends into their programmes. This ensures that their graduates possess highly relevant and sought-after skills. VIKO and KAUKO have robustly aligned their curriculum with regional labor market requirements, successfully integrating practical industry-oriented projects and hands-on training modules. University-level institutions (KTU, VU, VGTU) offer curricula with substantial theoretical foundations complemented by rigorous practical experiences, maintaining alignment with international standards and national educational requirements. These institutions have effectively balanced foundational knowledge with specialized technical skills, fostering comprehensive professional competencies.

On the other hand, VIKO should conduct a thorough curriculum review to streamline content, eliminating redundancy, and enhancing clarity in the programme structure. SMK and ŠVK are encouraged to continuously and systematically integrate emerging technological advancements into their programmes, ensuring long-term curriculum relevance and adaptability to industry needs. KAUKO could significantly enhance their offerings by expanding elective courses to cater to diverse student interests and emerging industry specializations. Additionally, university institutions should more rigorously integrate mathematics with IT disciplines, enhancing coherence across subjects to develop students' abilities in executing comprehensive software development processes, better reflecting real-world professional practices.

### **2. LINKS BETWEEN SCIENTIFIC (OR ARTISTIC) RESEARCH AND HIGHER EDUCATION**

Evaluations reveal strong, tangible integration between scientific research and educational activities across the evaluated institutions. SMK and ŠVK have particularly excelled in embedding cutting-edge research outcomes into their teaching, notably in areas such as AI, cybersecurity, and multimedia. They have effectively created environments where students actively engage with current research, enhancing their analytical and practical skills. VIKO and KAUKO have demonstrated substantial strength in practical industry-oriented research, successfully translating industry collaborations into meaningful student projects and applied learning opportunities. University-level institutions (KTU, VU, VGTU) stand out in terms of research productivity and scholarly contributions, with Vilnius University demonstrating exemplary performance in high-impact ISI journal publications. KTU excels in large-scale research and development projects, effectively bridging academia and industry through strategic partnerships and innovation hubs.

The expert panels recommended that KAUKO and VIKO should proactively foster greater student involvement in fundamental and applied research projects, cultivating a stronger research-oriented academic culture among students. SMK and ŠVK should maintain their momentum in research-

teaching integration, systematically incorporating new findings into curriculum revisions and student projects. Universities (KTU, VU, VGTU) should further intensify their efforts in publishing research in high-ranking international journals and conferences, increasing their global research visibility. These institutions are also advised to expand their research project portfolios and enhance corporate research collaborations, leveraging strategic partnerships to drive impactful innovation and student engagement.

### **3. STUDENT ADMISSION AND SUPPORT**

Student admission and support systems at all evaluated institutions demonstrate clarity, transparency, and effectiveness, ensuring that admitted students align closely with programme goals. SMK has established an exemplary framework for international student integration, providing comprehensive support services such as language assistance, cultural integration programs, and specialized academic advising. ŠVK has developed a robust mentoring system, offering personalized guidance and continuous support throughout student studies. VIKO and KAUKO effectively manage diverse student demographics, including mature and working students, through flexible scheduling, tailored advising, and career counseling. University-level institutions (KTU, VU, VGTU) have robust and systematic admission procedures and support structures, including targeted scholarships, counseling, tutoring services, and orientation programmes that significantly contribute to student success and satisfaction.

SMK should further strengthen intercultural training and structured activities to foster greater integration among international students, enhancing their overall study experience. VIKO and KAUKO are advised to refine and actively communicate their student support services, ensuring clarity and accessibility of career counseling, mental health resources, and academic guidance. Universities should proactively address challenges associated with low student mobility through intensified promotional activities, structured incentives, and broader Erasmus+ program awareness initiatives, thus significantly increasing both outgoing and incoming student participation.

### **4. TEACHING AND LEARNING, STUDENT ASSESSMENT, AND GRADUATE EMPLOYMENT**

Teaching and learning processes across all evaluated institutions demonstrate a strong commitment to academic excellence and student-centered methodologies. VIKO and KAUKO have successfully integrated innovative project-based learning approaches, promoting active student engagement, teamwork, and industry-relevant competencies. SMK and ŠVK have distinguished themselves by incorporating international industry collaboration into their curricula, providing students valuable global perspectives and practical experiences. University institutions (KTU, VU, VGTU) maintain a strong balance between theoretical rigor and practical application, systematically monitoring student progress, clearly defining course expectations, and utilizing advanced learning analytics tools. The employability rates among graduates from all evaluated institutions remain notably high, reflecting the effectiveness of curricula alignment with industry demands and rigorous academic standards.

All evaluated institutions are encouraged to further refine assessment methodologies, particularly for group assignments, ensuring fairness and balanced contribution recognition among students. Strengthening alumni networks and establishing structured graduate mentoring programs can substantially improve employability outcomes and ongoing professional support. University-level institutions should review the balance between theoretical instruction and practical training, specifically in internships and capstone projects, ensuring these experiences provide meaningful,

innovative learning opportunities closely linked to current industry practices. Inviting more international guest lecturers and industry-leading professionals to deliver specialized seminars and workshops could greatly enhance students' exposure to cutting-edge developments and best practices within the software engineering domain.

## **5. TEACHING STAFF**

The teaching staff across all institutions evaluated exhibit high standards of qualification, blending academic scholarship with practical industry experience. VIKO and KAUKO demonstrate notable strength in leveraging faculty with direct industry ties, thus significantly enriching practical learning opportunities. SMK and ŠVK stand out by maintaining continuous professional development programs for teaching staff, focusing on innovative pedagogical methods and updated technological competencies. The universities (KTU, VU, VGTU) showcase exemplary faculty qualifications with strong research profiles, extensive international collaboration, and participation in influential academic networks, ensuring that students benefit from cutting-edge knowledge and global perspectives.

The expert panels recommended that VIKO and KAUKO to further enhance continuous professional development opportunities, specifically focusing on pedagogical innovation, contemporary educational methodologies, and ongoing technological training. Universities should implement structured platforms for faculty to systematically exchange best practices and innovative teaching methodologies, enhancing overall instructional quality and consistency. Encouraging and facilitating international academic mobility among teaching staff through Erasmus+ and similar programs will further enrich teaching competencies and foster global academic partnerships.

## **6. LEARNING FACILITIES AND RESOURCES**

All evaluated institutions possess modern learning facilities and extensive resources essential for delivering high-quality education. VIKO and KAUKO have well-equipped laboratories specialized in software development and software testing, enabling students to acquire substantial hands-on experience. SMK and ŠVK are particularly commended for their state-of-the-art digital infrastructure, fostering an engaging and technologically advanced learning environment. University-level institutions (KTU, VU, VGTU) provide comprehensive, updated, and diverse educational resources, including specialized libraries, extensive access to digital databases, advanced computing clusters, and innovative student-centered platforms such as KTU's WANTed platform and VU's high-performance computing resources.

All institutions should continuously invest in upgrading and expanding their technological infrastructure, particularly focusing on cutting-edge technologies such as artificial intelligence, cybersecurity, and big data analytics. VIKO and KAUKO should regularly update lab equipment and software licenses to match current industry standards closely. SMK and ŠVK should maintain their leading positions by regularly reviewing and enhancing their digital learning environments. Universities are encouraged to prioritize infrastructure modernization projects, including the renovation of older laboratories, lecture halls, dormitories, and the timely completion of new construction projects, ensuring optimal learning and living conditions for students.

## **7. QUALITY ASSURANCE AND PUBLIC INFORMATION**

All institutions have effectively implemented quality assurance systems characterized by thorough and systematic approaches involving students, alumni, faculty, and social partners. Regular student feedback mechanisms are robust, significantly contributing to continual improvements across programmes. SMK and ŠVK exhibit particularly commendable transparency in public communication, clearly outlining programme specifics, quality assurance processes, and outcomes to both current and prospective students. VIKO and KAUKO have established effective internal quality assurance processes ensuring curriculum relevance and program effectiveness. University institutions (KTU, VU, VGTU) excel in integrating comprehensive stakeholder feedback into their quality assurance systems, demonstrating transparency and commitment to high academic standards.

All institutions should further enhance transparency and comprehensiveness in publicly available programme information, particularly by improving the visibility of quality assurance practices and outcomes. Universities (KTU, VU, VGTU) should expand their provision of detailed, accessible information in English, clearly documenting curriculum structures, research opportunities, international collaboration initiatives, and quality assurance practices. It is highly recommended that institutions actively involve employers and alumni more systematically in curriculum reviews and programme development councils to ensure consistent alignment with industry standards and evolving job market needs.

## III. RECOMMENDATIONS

### STRATEGIC RECOMMENDATIONS FOR THE SOFTWARE ENGINEERING FIELD OF STUDY

#### Strategic recommendations at an institutional level (for HEIs)

- Continuously update curricula to reflect technological advancements, particularly focusing on emerging technologies such as AI, IoT, cybersecurity, and big data.
- Expand internship and practical training opportunities across diverse sectors, ensuring students gain industry-relevant experiences.
- Foster interdisciplinary collaboration among academic departments to enrich curricula and research initiatives.
- Increase structured mentoring programs for students and recent graduates, enhancing employability and career readiness.
- Develop comprehensive professional development and pedagogical innovation programs for teaching staff, emphasizing contemporary teaching methodologies.
- Implement robust budgeting models that adequately reflect technology needs, infrastructure upgrades, and staffing requirements.
- Strengthen international cooperation and mobility programs for both students and staff to enhance global perspectives and academic excellence.
- Motivate and incentivize faculty research publication in high-impact international journals and active participation in reputable international conferences.

#### Strategic recommendations at the national level (for the Ministry of Education, Science and Sport)

- Provide targeted financial incentives and grants to institutions to support the development of niche technological specializations, particularly AI, cybersecurity, IoT, and big data analytics.
- Foster greater internationalization of Lithuanian HEIs by supporting international collaborations, student exchanges, and joint research initiatives.
- Develop national policies and initiatives promoting lifelong learning in ICT fields, responding to rapidly evolving industry demands.
- Encourage inter-institutional collaboration in research and teaching to leverage collective strengths and resources.
- Review and adjust regulations regarding university infrastructure utilization to facilitate industry collaborations and enable commercial opportunities, enhancing resource sustainability.
- Establish clear national priorities and funding strategies to support strategic areas of technological development and innovation.

#### Recommendations on the evaluation process for Centre for Quality Assessment in Higher Education (SKVC)

- Emphasize employability metrics as key criteria within the evaluation process, highlighting the practical impact of programmes on graduates' career outcomes.

- Clearly communicate evaluation expectations and guidelines to HEIs and evaluation committee members, ensuring consistency and transparency throughout the evaluation process.
- Integrate detailed industry impact assessments and comprehensive case studies into evaluation criteria, showcasing the direct contributions of study programmes to the technological and economic development of the region.
- Strengthen student involvement and systematically incorporate student feedback into all stages of the evaluation process, ensuring their perspectives significantly influence evaluation outcomes.
- Regularly review and update self-assessment requirements, ensuring clarity and completeness of documentation submitted by institutions.