

# Methodology Guide for Industry–Academia Collaboration in IT Education

*(Bridging Skill Gaps Through Structured Comparative  
Analysis, Round Tables, and AI-Supported Case-Based  
Micro-Modules)*

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## INTRODUCTION

The accelerating pace of technological transformation has fundamentally altered the competence profile expected from IT graduates. The modern IT professional is required not only to master programming languages, system architectures, artificial intelligence tools, cybersecurity mechanisms, and data-driven infrastructures, but also to operate effectively within multidisciplinary environments, communicate with non-technical stakeholders, manage uncertainty, and assess ethical and operational risks. As digital systems become deeply embedded within healthcare, transportation, manufacturing, finance, and public governance, the responsibility carried by IT professionals extends beyond technical functionality toward systemic reliability, security awareness, sustainability, and societal impact.

Higher education institutions continuously update curricula in response to technological change. However, despite reform efforts, structural misalignment between university education and industry expectations remains evident across multiple national contexts. Employers frequently report that graduates demonstrate strong theoretical foundations but encounter difficulties when translating knowledge into structured problem-solving, collaborative communication, stakeholder negotiation, or decision-making under time pressure. Alumni often describe their early professional experiences as a period of accelerated adaptation, where methodological, organizational, and contextual competencies had to be developed rapidly in practice.

This persistent gap cannot be addressed through isolated curriculum adjustments or informal consultation meetings. It requires a systematic, evidence-based, and cross-country methodological approach that enables structured identification of skill mismatches, collaborative validation of findings, and pedagogical integration of solutions. The methodology presented in this guide establishes such a framework.

The logic of the approach is sequential and cumulative. It begins with rigorous national-level analysis of study programs, industry needs, and alumni transition experiences. It then synthesizes findings across countries to identify structural common gaps. These gaps serve as the foundation for structured Industry–Academia Round Tables, where real-world challenges are transformed into harmonized case studies. The case studies are consolidated into a Case Study Book, which becomes the central pedagogical resource. Finally, the cases are operationalized into AI-supported micro-modules that guide students through structured reasoning processes aligned with industry-relevant skill development.

The methodology therefore ensures continuity from analysis to synthesis, from synthesis to co-creation, and from co-creation to educational implementation.

## PHASE 1 – NATIONAL ANALYSIS OF STUDY PROGRAMS, INDUSTRY REQUIREMENTS, AND ALUMNI EXPERIENCE

The first phase establishes the empirical foundation of the collaboration. Its purpose is to generate structured, comparable evidence regarding the alignment between educational supply and labor market demand within each participating country. The analysis is based on a triadic framework involving three stakeholder groups: universities, industry organizations, and alumni.

This triadic structure is essential because alignment cannot be assessed from a single perspective. Universities define learning outcomes and curricular depth. Industry defines required competencies and professional expectations. Alumni provide transitional insight, bridging formal education and professional reality.

Five IT study programs are selected in each country. The analysis examines curriculum design, learning outcomes, competence depth, and integration of cross-cutting skills. The focus extends beyond listing courses; it investigates how competencies are developed across the program lifecycle, whether skills are reinforced progressively, and how technical and non-technical competencies are interwoven.

Particular attention is paid to the balance between theoretical foundations and applied competence development. The analysis explores whether students are exposed to structured decision-making exercises, interdisciplinary collaboration scenarios, security-by-design principles, AI ethics discussions, or stakeholder communication practices. It also assesses how assessment methods reflect real-world complexity.

The study program analysis culminates in a structured report identifying strengths, limitations, and potential areas of misalignment.

In parallel, five industry organizations in each country provide structured input regarding expected competencies at job entry. This assessment captures both required proficiency levels and strategic priorities. Industry input emphasizes operational realities, including project timelines, team dynamics, regulatory requirements, and risk exposure.

Industry analysis frequently highlights gaps not in technical knowledge itself but in contextual application. For example, graduates may understand cybersecurity theory but lack systematic integration of security considerations into design workflows. Similarly, graduates may be proficient in coding yet struggle to communicate architectural decisions clearly to non-technical stakeholders. Industry feedback is synthesized into a structured overview of priority competencies.

Five alumni or early-career professionals provide reflective input on their transition experience. Their perspective identifies perceived readiness, areas of rapid professional growth, and unexpected competence demands. Alumni insights often reveal discrepancies between academic emphasis and workplace realities, particularly regarding soft skills, self-organization, stakeholder management, and responsibility awareness.

The three data streams are compared systematically. Skill mismatches are identified when industry consistently prioritizes competencies insufficiently embedded within curricula and perceived as underdeveloped by alumni. Each country produces a national synthesis report highlighting key gaps and contextual interpretations.

This phase ensures that the collaboration is grounded in structured evidence rather than anecdotal impressions.

The output of this phase is a structured national report containing aggregated data tables, qualitative interpretations, and a preliminary list of identified skill mismatches. This report forms the empirical foundation for subsequent cross-country comparison.

## **PHASE 2 – CROSS-COUNTRY COMPARATIVE ANALYSIS AND IDENTIFICATION OF STRUCTURAL SKILL GAPS**

Phase 2 represents the methodological pivot from national diagnosis to structural synthesis. While Phase 1 generates country-specific insights, Phase 2 determines whether identified mismatches are context-dependent or indicative of broader systemic patterns across educational ecosystems.

The primary objective of this phase is to move beyond isolated observations and identify structural alignment challenges shared across participating countries. This comparative synthesis strengthens the legitimacy of the findings, ensures that subsequent interventions are grounded in transnational evidence, and allows for coordinated strategic action.

The process begins with the collection of standardized national synthesis reports produced in Phase 1. Each country submits a structured summary that includes identified mismatches, qualitative explanations, contextual factors, and relative severity indicators. To ensure comparability, all reports follow the same analytical logic and skill taxonomy.

The comparative analysis proceeds in three structured steps.

First, a frequency-based mapping is conducted. All identified mismatches are categorized according to common skill domains. The number of countries reporting each mismatch is recorded. This step allows identification of recurring themes that appear consistently across multiple national contexts. A gap reported by one country may reflect a local regulatory or curricular issue, whereas a gap reported by the majority of participating countries signals a structural educational challenge.

Second, the analysis integrates a severity dimension. Frequency alone does not fully capture importance. Therefore, severity is assessed by examining industry priority levels, alumni transition difficulty, and degree of discrepancy between academic provision and industry demand. This multi-dimensional assessment ensures that selected priority gaps represent both recurring and high-impact challenges.

Third, qualitative convergence is examined. Narrative explanations from national reports are reviewed to identify common underlying mechanisms. For example, multiple countries may report difficulties in structured communication between technical and non-technical stakeholders, but the contextual explanation may vary. One country may attribute this to limited project-based learning exposure, another to insufficient integration of interdisciplinary assignments. By identifying shared root causes, the comparative phase deepens understanding beyond surface-level symptom identification.

The outcome of Phase 2 is the formal identification of five structural, cross-country skill gaps. These five gaps serve as strategic anchors for subsequent phases. They are not arbitrary selections but empirically validated focal areas derived from aggregated evidence.

This phase also produces a comparative synthesis report that articulates not only what the common gaps are, but why they persist and how they manifest across contexts. The report becomes a strategic reference document guiding the design of Industry–Academia Round Tables.

Importantly, Phase 2 ensures that the collaboration does not respond reactively to isolated national issues but instead addresses systemic alignment challenges requiring coordinated pedagogical innovation.

### **PHASE 3 – STRUCTURED INDUSTRY–ACADEMIA ROUND TABLES FOR CO-CREATION OF CASE STUDIES**

Phase 3 operationalizes the analytical findings of Phase 2 into collaborative solution design. The Industry–Academia Round Tables are not informal networking events but structured co-creation workshops explicitly designed to transform empirical gaps into pedagogically actionable case studies.

The central objective of this phase is to generate five structured case studies aligned directly with the five cross-country priority gaps identified in Phase 2. Each case must represent a real-world organizational challenge reflecting one structural skill deficit.

The round table process follows a carefully sequenced structure to ensure rigor and productive outcomes.

The session begins with a structured presentation of the cross-country synthesis report. This presentation ensures that all participants—industry representatives, academic staff, and facilitators—share a common understanding of the evidence base. This shared knowledge prevents discussions from reverting to anecdotal perceptions and instead grounds dialogue in validated comparative analysis.

Following the presentation, industry representatives are invited to articulate authentic challenges from their organizational context that reflect one or more of the identified structural gaps. The articulation of challenges must adhere to several methodological principles. Challenges must be formulated in generalized terms to ensure confidentiality. They must reflect systemic organizational issues rather than isolated technical problems. They must require structured reasoning, communication, decision-making, or cross-functional collaboration.

Once challenges are articulated, participants are divided into mixed working groups consisting of industry and academic representatives. Each group is assigned one structural gap and tasked with developing one case study aligned with that gap. The co-creation process involves iterative clarification of context, stakeholder identification, articulation of constraints, and formulation of expected student outputs.

A key feature of this phase is the emphasis on structural framing. Each case study must clearly define not only the challenge but also the type of competence students are expected to demonstrate. For example, if the identified gap concerns insufficient stakeholder communication, the case must require students to engage in structured communication mapping or translation between technical and non-technical domains.

The structured nature of the round table ensures that exactly five harmonized case studies are produced, each aligned with one priority gap. This alignment maintains coherence between analysis and pedagogical design.

The output of Phase 3 is a set of draft case studies that have been co-created by industry and academia, validated in real organizational contexts, and directly anchored in empirical findings.

#### **PHASE 4 – INTEGRATION AND HARMONIZATION WITHIN THE CASE STUDY BOOK**

Phase 4 consolidates the outputs of Phase 3 into a formally structured Case Study Book. This phase is essential to ensure consistency, comparability, and pedagogical clarity.

The draft case studies produced during the round tables are collected and subjected to editorial harmonization. This process does not alter the substance of the cases but ensures structural coherence. Each case is revised to follow an identical narrative architecture, including title, contextual background, structured challenge description, expected student contribution, and explicit identification of the relevant structural skill gap.

Harmonization also ensures balanced length, clarity of terminology, and elimination of ambiguities. Redundant contextual details are removed where necessary, and unclear problem statements are refined to enhance pedagogical usability.

The Case Study Book is structured to function not merely as a repository but as a coherent educational instrument. Cases are organized according to the five structural skill gaps. Introductory sections explain the methodological background and the alignment between identified gaps and case selection.

The Case Study Book serves multiple purposes. It provides instructors with ready-to-use, industry-validated learning material. It ensures consistency across institutions and countries. It demonstrates tangible outcomes of collaboration. It creates a shared pedagogical reference framework for further curriculum development.

A dedicated link to the finalized Case Study Book is included to enable easy access and dissemination - <https://ditec.taltech.ee/wp-content/uploads/2025/10/From-Dialogue-to-Impact-Industry%E2%80%93Academia-Roundtable-Case-Studies.pdf>.

#### **PHASE 5 – TRANSFORMATION OF CASE STUDIES INTO AI-SUPPORTED MICRO-MODULES**

Phase 5 represents the culmination of the methodology: the pedagogical operationalization of the Case Study Book into structured, AI-supported micro-modules.

The objective of this phase is to ensure that the case studies do not remain static textual material but become dynamic learning sequences embedded within teaching practice.

Each case is transformed into a micro-module structured around a sequential reasoning framework. The micro-module design enforces a stepwise analytical progression beginning with problem clarification and context comprehension. Students are required to identify stakeholders, constraints, systemic implications, and potential risks before proposing solutions. This structured progression reinforces disciplined problem decomposition.

The AI assistant is integrated as a methodological scaffold. Its role is not to generate answers but to guide cognitive processes. It prompts students to articulate assumptions explicitly, evaluate alternatives systematically, and reflect critically on trade-offs. By embedding AI within the learning sequence, the methodology simultaneously addresses two objectives: development of targeted skill gaps and preparation for AI-augmented professional environments.

The AI assistant also ensures consistency in micro-module delivery across institutions. It standardizes guidance prompts, maintains alignment with structural skill gaps, and supports reflective evaluation stages.

Each micro-module concludes with a structured reflection phase in which students articulate how the case relates to professional realities and how their proposed solutions address the underlying structural gap. This reflection strengthens metacognitive awareness and consolidates competence development.

The link to the AI assistant platform is included in the appendix to ensure accessibility and scalability - <https://chatgpt.com/g/g-6944007c95e881a4b70a8b785659bbdc-icy0034-innovating-through-design-thinking-and-cbl>.

Phase 5 ensures that the entire methodological process—from national analysis to cross-country synthesis to case co-creation—culminates in structured, sustainable, and technologically enhanced educational practice.

## **GOVERNANCE STRUCTURE AND CONTINUOUS ENGAGEMENT FRAMEWORK**

To ensure that the collaboration model described in this Methodological Guide functions as a sustainable governance mechanism rather than a one-time project activity, a clearly defined structure of roles, responsibilities, and operational procedures is established across all participating partners. This structure guarantees methodological consistency, accountability, and long-term integration of business input into IT curricula.

At the national level, each country designates an Academic Lead Institution responsible for coordinating the implementation of Phase 1. The Academic Lead oversees the structured analysis of study programs, ensures standardized data collection from industry partners and alumni, and prepares the national synthesis report. This role guarantees methodological alignment with agreed procedures and ensures the reliability and comparability of national findings. Within each participating university, a Curriculum Liaison supports internal coordination, facilitates access to program documentation, and ensures communication between academic staff and the project coordination team.

Industry participation is coordinated through a designated Industry Liaison Representative in each country. This role ensures structured engagement of companies, supervises completion of industry analysis inputs, and coordinates participation in round tables. The Industry Liaison also contributes to validation of case studies, ensuring that challenges accurately reflect authentic organizational contexts while respecting confidentiality and data protection standards.

At the transnational level, a Central Coordination Team is responsible for aggregating national reports and conducting the cross-country comparative analysis described in Phase 2. This team ensures consistent application of the agreed analytical framework and identifies structural skill gaps based on harmonized criteria. The Central Coordination Team prepares the comparative synthesis report, which serves as the formal basis for subsequent co-creation activities.

Industry–Academia Round Tables are implemented under the supervision of a dedicated Facilitation Team. This team ensures that discussions remain aligned with identified structural gaps and that each working group produces a case study consistent with the agreed narrative structure. The Facilitation Team documents outcomes, supports balanced participation, and ensures that outputs are suitable for pedagogical integration.

The consolidation of case studies into the Case Study Book is supervised by an Editorial and Quality Assurance Group. This group reviews draft cases for structural coherence, clarity, relevance, and alignment with the identified priority gaps. Where necessary, revisions are requested to ensure consistency in format and learning objectives. The Editorial Group oversees final harmonization and ensures that the Case Study Book is prepared for open-access dissemination.

Integration of case studies into AI-supported micro-modules is coordinated by a Pedagogical Integration Lead. This role ensures that each case is transformed into a structured learning sequence aligned with defined competence outcomes. The Pedagogical Lead supervises alignment between case content, instructional design, and AI-supported scaffolding. Pilot implementation is monitored, and feedback from instructors and students informs iterative refinement.

To ensure structured and continuous engagement beyond the funded project period, the methodology operates as a cyclical model. The national skill analysis may be repeated periodically to monitor evolving industry expectations. Round tables can be institutionalized as recurring collaboration forums. The Case Study Book functions as a living resource, enabling expansion and revision as technological and organizational contexts evolve. The AI-supported micro-module platform similarly allows updates and continuous pedagogical enhancement.

Quality assurance is embedded across all phases through peer validation, industry verification, and pilot testing. This multi-layered review mechanism ensures that business insights are systematically integrated into curricula and that teaching practices remain responsive to labor market developments.

Through this governance structure and continuous engagement framework, the methodology establishes a sustainable mechanism for structured Industry–Academia collaboration. Clear role definition, coordinated procedures, and cyclical implementation ensure that business input is embedded into IT education in a systematic, transparent, and long-term manner consistent with the objectives of Erasmus+ Cooperation Partnerships.

## CONCLUSION

The methodology presented in this guide establishes a coherent, evidence-based, and structurally integrated framework for aligning IT education with industry needs across national and cross-country contexts. Rather than approaching curriculum modernization as a series of isolated adjustments, the model introduces a sequential and cumulative process that ensures analytical rigor, collaborative validation, and pedagogical implementation.

The strength of the approach lies in its logical continuity. Phase 1 generates structured national evidence through systematic analysis of study programs, industry requirements, and alumni transition experiences. By triangulating these three perspectives, the methodology avoids one-dimensional interpretations of skill gaps and instead captures a multidimensional picture of alignment. This triadic diagnostic framework ensures that conclusions are not based solely on employer expectations or academic assumptions, but on comparative evidence grounded in educational provision, labor market demand, and lived professional experience.

Phase 2 elevates this national evidence into cross-country synthesis. Through structured comparative analysis, recurring patterns are identified, allowing differentiation between local curricular variations and structural transnational misalignments. The identification of five common skill gaps does not represent an arbitrary selection but rather an empirically validated prioritization of competencies requiring coordinated intervention. This cross-country perspective enhances legitimacy and strengthens the strategic dimension of subsequent collaboration.

Phase 3 operationalizes analytical findings into collaborative action through structured Industry–Academia Round Tables. The round table model ensures that empirical evidence directly informs the articulation of real-world challenges. By co-creating five harmonized case studies aligned with identified structural gaps, this phase transforms abstract findings into concrete, pedagogically usable material. The collaborative nature of the process strengthens mutual understanding between academia and industry, fostering long-term partnership rather than transactional consultation.

Phase 4 consolidates these outputs into a harmonized Case Study Book. The Case Study Book represents more than a compilation of examples; it embodies the structured translation of systemic skill gaps into educational instruments. By standardizing narrative architecture, clarifying learning objectives, and aligning cases with identified gaps, the book becomes a strategic pedagogical resource capable of supporting consistent implementation across institutions and countries.

Phase 5 completes the transformation by embedding case studies into AI-supported micro-modules. This final phase ensures that collaboration does not culminate in static documentation but results in dynamic learning sequences integrated into curricula. The structured micro-module architecture reinforces disciplined reasoning, stakeholder awareness, risk assessment, and reflective synthesis. The integration of an AI assistant as a methodological scaffold further prepares students for professional environments increasingly characterized by AI-augmented workflows. Importantly, the AI component does not replace human reasoning but strengthens structured analytical thinking.

Taken together, the five phases form a closed methodological loop: analysis, synthesis, co-creation, consolidation, and pedagogical implementation. Each phase builds upon the previous one, ensuring continuity and coherence. The methodology thereby transforms industry–academia collaboration from episodic dialogue into systemic educational innovation.

Beyond immediate curriculum development, the model establishes a sustainable governance mechanism. Annual repetition of Phase 1 analysis can monitor evolving skill demands. Cross-country comparison can identify emerging trends. New round tables can generate additional case studies as industries evolve. The Case Study Book can expand over time, and the AI-supported micro-modules can be continuously refined. This dynamic structure ensures adaptability to technological change and labor market transformation.

Furthermore, the methodology is inherently transferable. While developed within the context of IT education, its structure can be adapted to other domains facing similar alignment challenges between higher education and professional practice. The triadic diagnostic framework, comparative synthesis logic, participatory case co-creation model, and AI-supported micro-module architecture constitute a scalable blueprint for competence-oriented curriculum modernization.

In conclusion, this methodology provides a structured pathway from evidence generation to pedagogical innovation. It demonstrates that effective industry–academia collaboration requires analytical rigor, comparative validation, structured co-creation, and deliberate integration into teaching practice. By connecting empirical analysis with AI-supported educational design, the approach ensures that identified skill gaps are not merely documented but systematically addressed within sustainable learning ecosystems.

## APPENDIX

### Appendix A – Study Program Analysis Template

Skill Category	Specific Skills (examples)	Level Taught (Basic / Intermediate / Advanced)	Notes: please note which specific skills (per category) are taught in your study program? You may list additional skills freely.
<b>Mathematical Foundations</b>	Apply algebra, analysis, discrete mathematics, and statistics; model and solve technical problems using mathematical reasoning; understand algorithms through formal logic and combinatorics.	?	Please fill in your notes
<b>Programming &amp; Software Development</b>	Write structured and object-oriented programs in C, C++, Java, Python, and other languages; design, test, and debug software; use algorithms and data structures efficiently; algorithmic problem solving; Test & QA.	?	Please fill in your notes
<b>Software Engineering</b>	Analyze requirements; design architectures; document systems; apply design patterns; UML; version control; human-computer-interaction.	?	Please fill in your notes
<b>Computer Systems &amp; Architecture</b>	Logic design; processor design; operating systems; real-time systems; program at the assembly level; evaluate performance and reliability.	?	Please fill in your notes
<b>Networks &amp; Distributed Systems</b>	Configure and analyze computer networks; implement distributed and client-server systems; understand network protocols and security mechanisms; cloud computing; mobile computing and mobile applications	?	Please fill in your notes
<b>Data &amp; Information Management</b>	Design and manage relational databases; data modeling; query optimization; understand information systems and data consistency	?	Please fill in your notes
<b>Cybersecurity</b>	Understand threats, encryption methods, and system protection strategies; apply IT security principles in software and network contexts.	?	Please fill in your notes
<b>Artificial Intelligence &amp; Data Analysis</b>	Apply AI methods (search, learning, reasoning, ...); data analysis; build predictive models; understand ethical aspects of AI.	?	Please fill in your notes
<b>Methodological Skills &amp; Project Management</b>	Agile/Lean IT project management and project work; classical project management; user-centered design; Design Thinking;	?	Please fill in your notes

Skill Category	Specific Skills (examples)	Level Taught (Basic / Intermediate / Advanced)	Notes: please note which specific skills (per category) are taught in your study program? You may list additional skills freely.
	analytical/critical/creative thinking; decision-making; media literacy;		
<b>Business</b>	Understand business structures, finance, and business administration; link IT solutions to enterprise processes; manage interdisciplinary projects.	?	Please fill in your notes
<b>Law, Ethics &amp; Society</b>	Understand IT law, privacy, data protection, GDPR; evaluate the societal and ethical implications of computing; sustainability awareness; act responsibly as an IT professional.	?	Please fill in your notes
<b>Soft Skills &amp; Communication</b>	Communication; English; write technical reports; present complex topics clearly; teamwork; interdisciplinary collaboration; problem solving; adaptability; entrepreneurship.	?	Please fill in your notes
<b>Research &amp; Innovation</b>	Apply scientific methods, develop hypotheses, and evaluate results; scientific reasoning; scientific writing	?	Please fill in your notes
<b>Others</b>	Please feel free to list additional skills independent of category	?	Please fill in your notes

## Appendix B – Industry Needs Analysis Template

Skill Category	Specific Skills (examples)	Level Required (Basic / Intermediate / Advanced)	Priority (High / Med / Low)	Notes: please note which specific skills (per category) your company requires/expects from IT professionals? you may list additional skills freely.
<b>Mathematical Foundations</b>	Apply algebra, analysis, discrete mathematics, and statistics; model and solve technical problems using mathematical reasoning; understand algorithms through formal logic and combinatorics.	Level?	Priority?	Please fill in your notes
<b>Programming &amp; Software Development</b>	Write structured and object-oriented programs in C, C++, Java, & Python, and other languages; design, test, and debug software; use algorithms and data structures efficiently; algorithmic problem solving; Test & QA.	?	?	Please fill in your notes
<b>Software Engineering</b>	Analyze requirements; design architectures; document systems; apply design patterns; UML; version control; human-computer-interaction.	?	?	Please fill in your notes
<b>Computer Systems &amp; Architecture</b>	Logic design; processor design; operating systems; real-time systems; program at the assembly level; evaluate performance and reliability.	?	?	Please fill in your notes
<b>Networks &amp; Distributed Systems</b>	Configure and analyze computer networks; implement distributed and client-server systems; understand network protocols and security mechanisms; cloud computing; mobile computing and mobile applications	?	?	Please fill in your notes
<b>Data Information Management</b>	Design and manage relational & databases; data modeling; query optimization; understand information systems and data consistency	?	?	Please fill in your notes
<b>Cybersecurity</b>	Understand threats, encryption methods, and system protection strategies; apply IT security principles in software and network contexts.	?	?	Please fill in your notes
<b>Artificial Intelligence &amp; Data Analysis</b>	Apply AI methods (search, learning, reasoning, ...); data analysis; build predictive models; understand ethical aspects of AI.	?	?	Please fill in your notes

Skill Category	Specific Skills (examples)	Level Required (Basic / Intermediate / Advanced)	Priority (High / Med / Low)	Notes: please note which specific skills (per category) your company requires/expects from IT professionals? you may list additional skills freely.
<b>Methodological Skills &amp; Project Management</b>	Agile/Lean IT project management and project work; classical project management; user-centered design; Design Thinking; analytical/critical/creative thinking; decision-making; media literacy;	?	?	Please fill in your notes
<b>Business</b>	Understand business structures, finance, and business administration; link IT solutions to enterprise processes; manage interdisciplinary projects.	?	?	Please fill in your notes
<b>Law, Ethics &amp; Society</b>	Understand IT law, privacy, data protection, GDPR; evaluate the societal and ethical implications of computing; sustainability awareness; act responsibly as an IT professional.	?	?	Please fill in your notes
<b>Soft Skills &amp; Communication</b>	Communication; English; write technical reports; present complex topics clearly; teamwork; interdisciplinary collaboration; problem solving; adaptability; entrepreneurship.	?	?	Please fill in your notes
<b>Research &amp; Innovation</b>	Apply scientific methods, develop hypotheses, and evaluate results; scientific reasoning; scientific writing	?	?	Please fill in your notes
<b>Others</b>	Please feel free to list additional skills independent of category	?	?	Please fill in your notes

## Appendix C – Alumni Transition Reflection Template

Skill Category	Specific Skills (examples)	Learned at University (Yes / No / Level)	at Job Start (Yes / No / Level)	Notes: please note which specific skills (per category) you need as an IT professional at work? You may list additional skills freely.
<b>Mathematical Foundations</b>	Apply algebra, analysis, discrete mathematics, and statistics; model and solve technical problems using mathematical reasoning; understand algorithms through formal logic and combinatorics.	?	?	Please fill in your notes
<b>Programming &amp; Software Development</b>	Write structured and object-oriented programs in C, C++, Java, Python, and other languages; design, test, and debug software; use algorithms and data structures efficiently; algorithmic problem solving; Test & QA.	?	?	Please fill in your notes
<b>Software Engineering</b>	Analyze requirements; design architectures; document systems; apply design patterns; UML; version control; human-computer-interaction.	?	?	Please fill in your notes
<b>Computer Systems &amp; Architecture</b>	Logic design; processor design; operating systems; real-time systems; program at the assembly level; evaluate performance and reliability.	?	?	Please fill in your notes
<b>Networks &amp; Distributed Systems</b>	Configure and analyze computer networks; implement distributed and client-server systems; understand network protocols and security mechanisms; cloud computing; mobile computing and mobile applications	?	?	Please fill in your notes
<b>Data Information Management</b>	Design and manage relational & databases; data modeling; query optimization; understand information systems and data consistency	?	?	Please fill in your notes
<b>Cybersecurity</b>	Understand threats, encryption methods, and system protection strategies; apply IT security principles in software and network contexts.	?	?	Please fill in your notes
<b>Artificial Intelligence &amp; Data Analysis</b>	Apply AI methods (search, learning, reasoning, ...); data analysis; build predictive models; understand ethical aspects of AI.	?	?	Please fill in your notes

Skill Category	Specific Skills (examples)	Learned at University (Yes / No / Level)	at Job (Yes / No / Level)	Notes: please note which specific skills (per category) you need as an IT professional at work? You may list additional skills freely.
<b>Methodological Skills &amp; Project Management</b>	Agile/Lean IT project management and project work; classical project management; user-centered design; Design Thinking; analytical/critical/creative thinking; decision-making; media literacy;	?	?	Please fill in your notes
<b>Business</b>	Understand business structures, finance, and business administration; link IT solutions to enterprise processes; manage interdisciplinary projects.	?	?	Please fill in your notes
<b>Law, Ethics &amp; Society</b>	Understand IT law, privacy, data protection, GDPR; evaluate the societal and ethical implications of computing; sustainability awareness; act responsibly as an IT professional.	?	?	Please fill in your notes
<b>Soft Skills &amp; Communication</b>	Communication; English; write technical reports; present complex topics clearly; teamwork; interdisciplinary collaboration; problem solving; adaptability; entrepreneurship.	?	?	Please fill in your notes
<b>Research &amp; Innovation</b>	Apply scientific methods, develop hypotheses, and evaluate results; scientific reasoning; scientific writing	?	?	Please fill in your notes
<b>Others</b>	Please feel free to list additional skills independent of category	?	?	Please fill in your notes