European Software
Skills Alliance.

ESSA Learning programmes

ANNEX VII
Solution Designer
EQF 7

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Deliverable 10 – ESSA Learning Programmes & Materials – ANNEX VII

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About ESSA

The European Software Skills Alliance (ESSA) is a four-year transnational project funded under the EU's Erasmus+ programme. It ensures the skills needs of the rapidly evolving Software sector can be met — today and tomorrow.

ESSA provides current and future software professionals, learning providers and organisations with software needs with the educational and training instruments they need to meet the demand for software skills in Europe.

ESSA will develop a European Software Skills Strategy and learning programmes for Europe. It will address skill mismatches and shortages by analysing the sector in depth and delivering future-proof curricula and mobility solutions; tailored to the European software sector's reality and needs.

Project partners

The ESSA consortium is led by DIGITALEUROPE. It is composed of academic and non-academic partners from the education, training, and software sectors.

View all project partners: ESSA Partners | ESSA Associated Partners

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List of abbreviations and acronyms

Abbreviation	Term
e-CF, EN 16234-1	European e-Competence Framework, European Norm 16234 - Part 1: Framework
ECTS	European Credit Transfer and Accumulation System
EQF	European Qualifications Framework
ESSA	European Software Skills Alliance
LO	Learning Outcome
PLO	Programme Learning Outcome

1 Solution Designer EQF 7 - ESSA Learning Programme

1.1 University students interested in advanced tech studies and professionals seeking upskilling/reskilling opportunities

Executive summary

This course is being designed by Hellenic Open University (EL). The Curriculum for Solution Designer (EQF Level 7) is tailored to university students interested in advanced tech studies and professionals seeking upskilling/reskilling opportunities. The curriculum is comprised of 14 Learning Units each one corresponding to 2-3 ECTCS. The program blends theory and practical application to bridge the skill gap in the dynamic IT industry. The curriculum leverages a blended learning model, combining the presence classroom, virtual classroom, and e-learning methods. These are complemented by work placement opportunities, allowing students to gain real-world experience in designing software solutions. Taking into consideration the localisation aspects, the program pays special attention to the specific technology maturity level. This ensures that graduates are not only versed in the latest technologies but also understand their implementation within the local tech ecosystem and regulatory framework.

1.1.1 PLO 1. Needs identification [e-4]

1. PLO Needs Identification [e-4]	
The learner has demonstrated capability *→ to propose different creative solutions for complex problems and* *→ to advise the customer*	
Unit learning outcomes	Guides the process of identification of customer needs in line with the overall business (e.g, market, strategy, value proposition)
	Writes an advisory report with a creative proposal with possible solutions to specific business need(s), considering advanced/innovative methods and technologies (e.g. by comparing and analysing different solutions/ suppliers, weighing costs/benefits, clarifying value proposition)

1.1.1.1 Duration of Study

Recommended duration: starting from 2 ECTS

Often integrated with studies of PLOs: -

1.1.1.2 Recommendations for Micro-credentials

This PLO is recommended as an independent micro-credential for introducing software experts to methods for needs identification of complex software.

1.1.1.3 Recommendations on Didactical Approach, Delivery Methods and Training Environment

Recommended didactical approach:

- Virtual Classroom ☒
- e-learning ☒
- Work placement ☒

Additional comments

Recommended delivery methods:

- Lecture ☒ up to 50%
- Case study. Individual/team project ☒ 50+%

Additional comments

Lectures, e-learning are recommended for learning the basic principles, terminology, and models of needs analysis. These should be reinforced through practical tasks, case studies, individual projects.

1.1.1.4 WBL and Follow-up Reinforcement

After learning the basic principles, terminology, and methods of needs analysis, the study should focus on analysing and simulating real work-life-like tasks as, for example:

- Systems Design & Architecture: Understanding how to design scalable, secure, and efficient software solutions to meet identified needs. This includes designing system architectures, data structures, algorithms, and user interfaces.
- Project Management: Mastering techniques for managing projects efficiently, including agile and waterfall methodologies, resource management, risk assessment, and project lifecycle management.
- Problem-Solving and Innovation: Enhancing critical thinking and innovative problem-solving abilities, vital for creating effective and novel software solutions.
- User Experience (UX) Design: Learning how to make software solutions intuitive and user-friendly, taking into account usability and accessibility standards.

1.1.1.5 Important (new) approaches and technologies to consider

- DevOps and Agile Methodologies: These practices promote faster, more efficient development through continuous integration, delivery, and testing. They foster a collaborative environment where development and operations teams work in unison.
- Microservices Architecture: This design approach structures an application as a collection of loosely coupled services, which can improve modularity and make the application easier to understand, develop, and scale.

- Cloud Computing and Cloud Services: Cloud platforms like AWS, Azure, and Google Cloud are increasingly essential in solution design. Familiarity with Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) is crucial.
- Containerization and Orchestration: Technologies like Docker and Kubernetes are becoming integral for packaging applications into standardized units for development, shipment, and deployment.
- Artificial Intelligence and Machine Learning: These technologies are changing how software solutions are designed and deployed, enabling more personalized user experiences and better data-driven decisions.

1.1.1.6 Assessment

Unit learning outcome	Assessment method	Validation of prior acquired competences (skills and knowledge)
Guides the process of identification of customer needs in line with the overall business (e.g, market, strategy, value proposition)	Practical assignment	Assessment (of skills)
Writes an advisory report with a creative proposal with possible solutions to specific business need(s), considering advanced/innovative methods and technologies (e.g. by comparing and analysing different solutions/ suppliers, weighing costs/benefits, clarifying value proposition)	Report	Assessment (of report)

1.1.2 Learning Resources - PLO 1. Needs identification [e-4]

LEARNING UNIT	EQF	Duration	Didactical Approach	ASSESSMENT	Title of the Learning material	Delivery method of the learning material	Quick link to learning materials
Solution Architects in an Organization	7	1 ECTS	e-learning	Practical assignment	Solution Architects in an Organization.docx	Lecture/Project	PLO 1 - Needs identification e4
Attributes of the Solution Architecture	7	1 ECTS	e-learning	Report	Attributes of the Solution Architecture.docx	Lecture/Project	PLO 1 - Needs identification e4

1.1.3 PLO 2. Architecture Design [e-4]

2. PLO Architecture design [e-4]	
The learner has demonstrated capability *→ to propose a coherent architecture design* *→ to specify a structured approach to implement an ICT solution*	
Unit learning outcomes	Proposes a coherent architecture design for an innovative/ advanced solution or technology, taking into account relevant business and technological issues (e.g., business evolution and needs, budget and other resources; current technology, obsolescent equipment)
	Develops a technology roadmap; an approach or strategy to implement a solution or technology (e.g., identifies change requirements, components affected/ involved by the implementation of specific solutions/ services)

1.1.3.1 Duration of Study

Recommended duration: starting from 2 ECTS

Often integrated with studies of PLOs: -

1.1.3.2 Recommendations for Micro-credentials

This PLO is recommended as an independent micro-credential for introducing software experts to advance methods of architecture design.

1.1.3.3 Recommendations on Didactical Approach, Delivery Methods and Training Environment

Recommended didactical approach:

- Virtual Classroom ☒
- e-learning ☒
- Work placement ☒

Additional comments

n/a

Recommended delivery methods:

- Lecture ☒ up to 50%
- Case study. Individual/team project ☒ 50+%

Additional comments

Lectures, e-learning are recommended for learning advanced principles of software architecture design.

1.1.3.4 WBL and Follow-up Reinforcement

After learning the basic principles, terminology, and methods of needs analysis, the study should focus on analysing and simulating real work-life-like tasks as, for example:

- Designing Scalable Systems: Assign tasks where students must design a system that can handle significant scaling. For example, designing the architecture for a high-traffic e-commerce site or a global social media platform.
- Refactoring Monolithic Applications: Provide a monolithic application and instruct students to refactor it into a microservices architecture. This gives students hands-on experience with the challenges and benefits of this architectural style.
- Building Secure Systems: Create exercises where students must design a system with particular security needs, such as a banking or healthcare data management system.

1.1.3.5 Important (new) approaches and technologies to consider

- Microservices Architecture: As opposed to monolithic architecture, microservices break down an application into its core functions, each running independently. This approach promotes scalability and ease of updates.
- Containerization: Technologies like Docker encapsulate software in a complete filesystem with everything required to run, ensuring consistency across various computing environments.

1.1.3.6 Assessment

Unit learning outcome	Assessment method	Validation of prior acquired competences (skills and knowledge)
Proposes a coherent architecture design for an innovative/ advanced solution or technology, taking into account relevant business and technological issues (e.g., business evolution and needs, budget and other resources; current technology, obsolescent equipment)	Practical assignment	Assessment (of skills)
Develops a technology roadmap; an approach or strategy to implement a solution or technology (e.g., identifies change requirements, components affected/ involved by the implementation of specific solutions/ services)	Report	Assessment (of report)

1.1.4 Learning Resources - PLO 2. Architecture Design [e-4]

LEARNING UNIT	EQF	Duration	Didactical Approach	ASSESSMENT	Title of the Learning material	Delivery method of the learning material	Quick link to learning materials
Principles of Solution Architecture Design	7	1 ECTS	e-learning	Practical assignment	Principles of Solution Architecture Design.docx	Lecture/Project	PLO 2 - Architecture design e4 PLO 2 - Architecture design e4
Cloud Migration and Hybrid Cloud Architecture Design	7	1 ECTS	e-learning	Report	Cloud Migration and Hybrid Cloud Architecture Design.docx	Lecture/Project	PLO 2 - Architecture design e4 PLO 2 - Architecture design e4

1.1.5 PLO 3. Innovating [e-4]

3. PLO Innovating [e-4]	
The learner has demonstrated capability *→ to propose and evaluate creative ideas on the application of novel technologies* *→ to develop a product innovation plan* *→ to design a Proof of Concept*	
Unit learning outcomes	Applies idea generation and evaluation techniques to propose and evaluate creative ideas on the application of novel technologies – formulates an idea proposal and idea evaluation
	Writes a product innovation plan on the exploitation of technological advances to introduce a new business, product or service.
	Designs and executes a Proof of Concept to check feasibility of product innovation

1.1.5.1 Duration of Study

Recommended duration: starting from 3 ECTS

Often integrated with studies of PLOs: -

1.1.5.2 Recommendations for Micro-credentials

- Recommended as an independent micro-credential for upskilling senior Solution Designers.

1.1.5.3 Recommendations on Didactical Approach, Delivery Methods and Training Environment

Recommended didactical approach:

- e-learning ☒
- Work placement ☒

Additional comments

Recommended delivery methods:

- Lecture ☒ up to 50%
- Case study. Individual/team project ☒ 50+%

Additional comments

Lectures, e-learning are recommended for learning the basic principles, terminology, and models of software design. These should be reinforced through practical tasks, case studies, individual/team-projects.

1.1.5.4 WBL and Follow-up Reinforcement

After learning the basic principles, terminology, and methodologies for innovating, the study should focus on analysing and simulating real work-life-like tasks as, for example:

- Prototyping and Testing: Develop the skills to turn ideas into working prototypes. Learn various testing methodologies to ensure functionality, usability, and performance of the prototype.
- Iterative Development: Learn how to use feedback from prototype testing to iterate and refine the idea. This could involve making improvements, identifying bugs, or making changes to better meet user needs.
- Business Case Development: Understand how to create a compelling business case for your idea. This includes market analysis, cost-benefit analysis, and strategies for implementation.

1.1.5.5 Important (new) approaches and technologies to consider

- Design Thinking: This human-centric approach to innovation emphasizes empathy, iteration, and multidisciplinary collaboration. It's a proven framework for solving complex problems.
- Lean Startup Methodology: An approach that favors iterative product releases to gain valuable customer feedback, make adjustments, and pivot when necessary, reducing product development cycles and increasing efficiency.
- Agile Development: A flexible and iterative method of software development that involves constant collaboration between cross-functional teams and stakeholders. It allows for quick adjustments and continuous improvement in response to changes.

1.1.5.6 Assessment

Unit learning outcome	Assessment method	Validation of prior acquired competences (skills and knowledge)
Applies idea generation and evaluation techniques to propose and evaluate creative ideas on the application of novel technologies – formulates an idea proposal and idea evaluation	Practical assignment	Assessment (of skills)
Writes a product innovation plan on the exploitation of technological advances to introduce a new business, product or service.	Practical assignment	Assessment (of skills)
Designs and executes a Proof of Concept to check feasibility of product innovation	Practical assignment	Assessment (of skills)

1.1.6 Learning Resources - PLO 3. Innovating [e-4]

LEARNING UNIT	EQF	Duration	Didactical Approach	ASSESSMENT	Title of the Learning material	Delivery method of the learning material	Quick link to learning materials
Solution Architecture Design Patterns	7	2 ECTS	e-learning	Practical assignment	Solution Architecture Design Patterns.docx	Lecture/Project	PLO 3 - Innovating e4
Performance Considerations	7	2 ECTS	e-learning	Practical assignment	Performance Considerations.docx	Lecture/Project	PLO 3 - Innovating e4
Security Considerations	7	2 ECTS	e-learning	Practical assignment	Security Considerations.docx	Lecture/Project	PLO 3 - Innovating e4

1.1.7 PLO 4. Profession related competences [EQF7]

4. PLO Profession related competences [EQF7]	
The learner has demonstrated capability *→ to apply profession related skills*	
Unit learning outcomes	Advises on the application of a new technology. Given a certain situation or context, writes a report with recommendations or an advice on a solution that involves the application of a new technology. Reflects critically on a new technology
	Analyses, improves, and provides expert advice and guidance on security standards, regulations, measures, methods, tools, and techniques, taking into account the broader business context and current IT developments
	Analyses, improves, and provides expert advice and guidance on sustainability standards, regulations, measures, and methods, taking into account the broader business context and current IT developments
	Is continuously aware of ethical considerations and issues and applies these in professional contexts and activities. Forms and communicates an opinion based on incomplete and or limited information, taking into account social, scientific and ethical responsibilities related to the application of own knowledge and opinions. Promotes ethical thinking

1.1.7.1 Duration of Study

Recommended duration: starting from 3 ECTS

Often integrated with studies of PLOs: -

1.1.7.2 Recommendations for Micro-credentials

- This PLO should be an integral part of the studies for students with no prior knowledge of software development.
- Recommended as an independent micro-credential for upskilling Solution Designers.

1.1.7.3 Recommendations on Didactical Approach, Delivery Methods and Training Environment

Recommended didactical approach:

- e-learning ☒

Additional comments

n/a

Recommended delivery methods:

- Lecture ☒ up to 50%
- Case study. Individual/team project ☒ 50+%

Additional comments

Lectures, e-learning are recommended for learning the basic principles, terminology, and behaviour models of various Solution Designer Soft Competences. These should be reinforced through practical tasks and case studies.

1.1.7.4 WBL and Follow-up Reinforcement

After learning the basic principles, the study should focus on analysing and simulating real work-life-like tasks as, for example:

- Ethical Impact Assessment: Students can be given a scenario where they have to design a solution with potential ethical implications (e.g., a facial recognition system). They will need to identify the ethical considerations, discuss possible mitigation strategies, and justify their decisions in the context of existing ethical frameworks.
- Sustainable Solution Development: In this task, students could design a software solution with specific sustainability requirements, like minimizing power usage or ensuring the solution is designed in a way that it would remain relevant and usable for a long period of time (longevity). They could also be asked to assess and optimize the energy consumption of existing software systems.
- Accessibility and Inclusivity: In this task, students can be asked to design software that meets accessibility standards and is usable for people with various disabilities. They could be asked to simulate the experience of using their software as a person with a disability, and make necessary adjustments to improve accessibility.

1.1.7.5 Important (new) approaches and technologies to consider

- Green Software Engineering: This involves developing software in a way that minimizes its impact on the environment, for instance by optimizing its resource usage. This approach aligns with the growing emphasis on sustainability in all fields of technology.
- Ethics in AI: Given the increasing use of AI in decision-making processes, understanding how to develop and implement these systems ethically is crucial. This includes knowledge of bias, fairness, transparency, and accountability in AI systems.

1.1.7.6 Assessment

Unit learning outcome	Assessment method	Validation of prior acquired competences (skills and knowledge)
Advises on the application of a new technology. Given a certain situation or context, writes a report with recommendations or an advice on a solution that involves the application of a new technology. Reflects critically on a new technology	Report	Assessment (of report)
Analyses, improves, and provides expert advice and guidance on security standards, regulations, measures, methods, tools,	Report	Assessment (of report)

and techniques, taking into account the broader business context and current IT developments		
Analyses, improves, and provides expert advice and guidance on sustainability standards, regulations, measures, and methods, taking into account the broader business context and current IT developments	Report	Assessment (of report)
Is continuously aware of ethical considerations and issues and applies these in professional contexts and activities. Forms and communicates an opinion based on incomplete and or limited information, taking into account social, scientific and ethical responsibilities related to the application of own knowledge and opinions. Promotes ethical thinking	Report	Assessment (of report)

1.1.8 Learning Resources – PLO 4. Profession related competences [EQF7]

LEARNING UNIT	EQF	Duration	Didactical Approach	ASSESSMENT	Title of the Learning material	Delivery method of the learning material	Quick link to learning materials
Security Considerations	7	1	eLearning	Report	*Security Considerations.docx*	Lecture/Project	PLO 4 - Profession related competences EQF7
Cost Considerations	7	1	eLearning	Report	*Cost Considerations.docx*	Lecture/Project	PLO 4 - Profession related competences EQF7
Solution Architecture Document	7	1	eLearning	Report	*Solution Architecture Document.docx*	Lecture/Project	PLO 4 - Profession related competences EQF7

1.1.9 PLO 5. Soft competences [EQF7]

5. PLO Soft competences [EQF7]	
The learner has demonstrated capability *→ to apply soft skills*	
Unit learning outcomes	Related to the occupation, knowledge domain, and field of science critically collects: in-depth and detailed professional and scientific information on a range of basic theories, principles and concepts, as well as information on some important current issues and topics. Analyses, evaluates, and combines critically this information, knowledge and insights and presents this in a scientific way. Critically applies/ translates/ interprets results of research (possibly executed by others) to the own context (the occupation and/or knowledge domain). Executes detailed scientific research
	Exercises (self-)management in situations that are complex, unpredictable and require new strategic approaches. Is able to cope with change (positive or negative), to adapt to a considerable level of variety in the workplace and to transform the work or study context. Handles pressure and setbacks and maintains composure. Shows initiative, creativity and originality and carries responsibility for the results of own activities, work and or study and for the work results of others. Works correctly and carefully, fully aware of the importance of trustworthiness and accountability.
	Realises learning and personal development, mostly autonomous and based on intrinsic motivation, looking for personal learning objectives. Selects and uses training/instructional methods and procedures appropriate for the situation when learning or teaching new things.

1.1.9.1 Duration of Study

Recommended duration: starting from 2 ECTS

Often integrated with studies of PLOs: PLO 4

1.1.9.2 Recommendations for Micro-credentials

- This PLO should be an integral part of the initial studies for students with no prior knowledge of software development.
- Recommended as an independent micro-credential for upskilling Solution Designers.

1.1.9.3 Recommendations on Didactical Approach, Delivery Methods and Training Environment

Recommended didactical approach:

- e-learning ☒

Additional comments
n/a

Recommended delivery methods:

• Lecture	☒ up to 50%
• Case study. Individual/team project	☒ 50+%

Additional comments

n/a

1.1.9.4 WBL and Follow-up Reinforcement

After learning the basic principles, terminology, and model soft competences, the study should focus on analysing and simulating real work-life-like tasks as, for example:

- Project Management Simulation: Assign students a project where they need to develop a hypothetical software solution. This could be anything from a mobile app to a data analysis system. Make the project parameters vague and open-ended, and introduce unexpected changes or challenges partway through. This will require them to strategize, adapt, and manage their resources effectively. To enhance the complexity, include multiple stakeholders with varying interests and requirements.
- Peer-Led Learning Sessions: Encourage students to select a topic related to the course content that they're particularly interested in, and then task them with leading a class session or workshop on that topic. This will help foster autonomous learning and teaching skills, and help them develop the ability to choose appropriate instructional methods for different situations.
- Failure Analysis: Have students examine real-life cases of software solution failures. They could analyse why the solution failed, how the situation was managed, and how it could have been handled better. This will help them learn how to handle setbacks, manage pressure, and strategize in complex, unpredictable situations.
- Independent Research Project: Assign an open-ended research project that requires students to investigate and present on a current trend or issue in the software solutions field. The project can be chosen based on the students' own interests, encouraging intrinsic motivation and personal learning objectives.

1.1.9.5 Important (new) approaches and technologies to consider

- Collaborative Tools: Technologies like Microsoft Teams, Slack, and GitHub facilitate collaboration and can help students learn to work as part of a team, manage their time and tasks, and navigate a remote work environment.
- Online Learning Platforms: Sites like Coursera, edX, and LinkedIn Learning allow students to pursue additional learning autonomously. This can be particularly useful for helping them find and explore personal learning objectives.
- Digital Portfolios: Tools like GitHub, Behance, and Dribbble allow students to showcase their work and track their learning progress. These portfolios can also help them reflect on their growth, set goals, and take responsibility for their learning outcomes.

1.1.9.6 Assessment

Unit learning outcome	Assessment method	Validation of prior acquired competences (skills and knowledge)
Related to the occupation, knowledge domain, and field of science critically collects: in-depth and detailed professional and scientific information on a range of basic theories, principles and concepts, as well as information on some important current issues and topics. Analyses, evaluates, and combines critically this information, knowledge and insights and presents this in a scientific way. Critically applies/ translates/ interprets results of research (possibly executed by others) to the own context (the occupation and/or knowledge domain). Executes detailed scientific research	360º assessment	360º assessment
Exercises (self-)management in situations that are complex, unpredictable and require new strategic approaches. Is able to cope with change (positive or negative), to adapt to a considerable level of variety in the workplace and to transform the work or study context. Handles pressure and setbacks and maintains composure.	Practical assignment	Assessment (of skills)
Shows initiative, creativity and originality and carries responsibility for the results of own activities, work and or study and for the work results of others.	Practical assignment	Assessment (of skills)

1.1.10 Learning Resources - PLO 5. Soft competences [EQF7]

LEARNING UNIT	EQF	Duration	Didactical Approach	ASSESSMENT	Title of the Learning material	Delivery method of the learning material	Quick link to learning materials
Learning Soft Skills to Become a Better Solution Architect	7	2 ECTS	eLearning	Practical assignment	*Learning Soft Skills to Become a Better Solution Architect.docx*	Lecture/Project	PLO 5 - Soft competences eqf7

1.1.11 PLO 6. Functioning in organisation [EQF7]

6. PLO Functioning in organisations [EQF7]	
The learner has demonstrated capability *→ to function in an organisational context*	
Unit learning outcomes	Explains organisation theory and behaviour
	Describes the relationship between business and IT
	Works in an organisational context under broad direction, performing coordinating activities, with at least 3 years of working experience at an intermediate or senior level, as e.g., a specialist, team leader, manager, or a comparable role
	Leads a project
	Writes a report on functioning in organisation

1.1.11.1 Duration of Study

Recommended duration: starting from 2 ECTS

Often integrated with studies of PLOs: PLO 4, PLO5

1.1.11.2 Recommendations for Micro-credentials

- Recommended as an independent micro-credential for upskilling Software Designers.

1.1.11.3 Recommendations on Didactical Approach, Delivery Methods and Training Environment

Recommended didactical approach:

- e-learning ☒
- Work placement ☒

Additional comments

Recommended delivery methods:

- Lecture ☒ up to 50%
- Case study. Individual/team project ☒ 50+%

Additional comments

Lectures, e-learning are recommended for learning the basic principles, terminology, and models of software design. These should be reinforced through practical tasks and case studies.

1.1.11.4 WBL and Follow-up Reinforcement

After learning the basic principles, terminology, and models of how a Solution Designer should function within an organisation, the study should focus on analysing and simulating real work-life-like tasks as, for example:

- Case Study Analysis: Students can study real-life examples of successful and unsuccessful software projects within organizations. They can analyze what went well, what went wrong, and how organizational theory and behavior influenced the outcomes.
- Cross-functional Teamwork: Assign students to teams that mimic the structure of a real software development team, with roles such as project manager, developer, UX/UI designer, and quality assurance. This task will help them understand the dynamics of working in a cross-functional team and the challenges and benefits that come with it.
- Stakeholder Communication Simulation: In this task, students can simulate meetings with various stakeholders, such as clients, senior management, or other teams within the organization. This will give them practice communicating effectively in a professional setting and managing expectations.

1.1.11.5 Important (new) approaches and technologies to consider

- Digital Collaboration Tools: Platforms like Slack, Microsoft Teams, or Asana can simulate real-world project management and team collaboration. They can help students learn how to coordinate with remote or distributed teams, which is increasingly common in the software industry.
- Business Process Automation Tools: Software like Zapier or Integromat can be introduced to show students how repetitive tasks can be automated in an organization, thus improving efficiency and allowing more focus on strategic tasks.
- Data Analytics Tools: Understanding data analytics tools like Google Analytics, Tableau, or PowerBI can be essential for making data-driven decisions. These tools can support case study analysis and help students grasp the impact of metrics and KPIs on organizational behavior and strategies.

1.1.11.6 Assessment

Unit learning outcome	Assessment method	Validation of prior acquired competences (skills and knowledge)
Explains organisation theory and behaviour	Practical assignment	Assessment (of skills)
Describes the relationship between business and IT	Self-reflection report	Assessment (of report)

1.1.12 Learning Resources - PLO 6. Functioning in organisation [EQF7]

LEARNING UNIT	EQF	Duration	Didactical Approach	ASSESSMENT	Title of the Learning material	Delivery method of the learning material	Quick link to learning materials
Data Engineering for Solution Architecture	7	1 ECTS	eLearning	Practical assignment	*Data Engineering for Solution Architecture.docx*	Lecture/Project	PLO 6 - Functioning in organization eqf7
Rearchitecting Legacy Systems	7	1 ECTS	eLearning	Practical assignment	*Rearchitecting Legacy Systems.docx*	Lecture/Project	PLO 6 - Functioning in organization eqf7
Solution Architecture Document	7	1 ECTS	eLearning	Self-reflection report	*Solution Architecture Document.docx*	Lecture/Project	PLO 6 - Functioning in organization eqf7

1.1.13 EXTRA CURRICULAR PLO: New Technology [EQF7]

PLO New Technology [EQF7]	
The learner has demonstrated capability *→ to provide solutions based on new software technologies.*	
Unit learning outcomes	Given a certain situation or context, writes a report with recommendations or an advice on a solution that involves the application of (a method, technique or tool related to) a new technology, considering specific issues related to this technology (e.g., impact on the organisation/ business/ society; security, ethical issues)
	Writes a critical reflection on a new technology

1.1.13.1 Duration of Study

Recommended duration: starting from 2 ECTS

Often integrated with studies of PLOs:

1.1.13.2 Recommendations for Micro-credentials

- Recommended as an independent micro-credential for upskilling Solution Designers.

1.1.13.3 Recommendations on Didactical Approach, Delivery Methods and Training Environment

Recommended didactical approach:

- e-learning ☒
- Work placement ☒

Additional comments

n/a

Recommended delivery methods:

- Lecture ☒ up to 50%
- Case study. Individual/team project ☒ 50+%

Additional comments

E-learning is recommended for learning the basic principles, terminology, and models of how to use new technologies as a Solution Designer. These should be reinforced through practical tasks, case studies, individual/team-projects.

1.1.13.4 WBL and Follow-up Reinforcement

After learning the basic principles, terminology, the study should focus on analysing and simulating real work-life-like tasks as, for example:

- Case Study Analysis: Assign students real-life case studies of businesses that have implemented a new technology. Have them analyze the impact, challenges, ethical considerations, and overall effectiveness, and then write a report on their findings.
- Technology Adoption Proposal: Task students with identifying a new technology relevant to their field of interest. They should write a report recommending how an organization could adopt this technology, what impact it could have on the business and broader society, and what security and ethical issues need to be considered.
- Ethical Impact Assessment: Students could write a report on a proposed solution involving a new technology that has potential ethical implications. They should identify the ethical considerations and propose mitigation strategies, relating their discussion to ethical theories and frameworks.

1.1.13.5 Important (new) approaches and technologies to consider

- Sustainable and Green Technologies: With the growing emphasis on environmental sustainability, it's important to consider the environmental impact of new technologies and how they can be used to support green initiatives.
- 5G Technology: The rollout of 5G brings improved connectivity and opens the door to new applications, but also brings about considerations in terms of infrastructure, health, and security.

1.1.13.6 Assessment

Unit learning outcome	Assessment method	Validation of prior acquired competences (skills and knowledge)
Given a certain situation or context, writes a report with recommendations or an advice on a solution that involves the application of (a method, technique or tool related to) a new technology, considering specific issues related to this technology (e.g., impact on the organisation/ business/ society; security, ethical issues)	Assessment (of report)	Certification
Writes a critical reflection on a new technology	Assessment (of report)	Certification

1.1.14 Learning Resources - EXTRA CURRICULAR PLO: New Technology [EQF7]

LEARNING UNIT	EQF	Duration	Didactical Approach	ASSESSMENT	Title of the Learning material	Delivery method of the learning material	Quick link to learning materials
Architectural Reliability Considerations	7	1 ECTS	eLearning	Assessment (of report)	*Architectural Reliability Considerations.docx*	Lecture/Project	PLO 7 New Technology
Operational Excellence Considerations	7	1 ECTS	eLearning	Assessment (of report)	*Operational Excellence Considerations.docx*	Lecture/Project	PLO 7 New Technology

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