

European Software  
Skills Alliance.

# **Train the Trainer Programme**

---

## **Annex III Developer EQF 7**

30 November 2023  
Status: Final version

**di  
SS  
e**

**Copyright © 2023 by the European Software Skills Alliance.** The project resources contained herein are publicly available under the [Creative Commons license 4.0 B.Y](https://creativecommons.org/licenses/by/4.0/)

### **Train the Trainer Programme – Annex III – Developer EQF 7, 2023.**

Deliverable 13: “ESSA Train the Trainer Programme & Materials”– Annex III

*This document is a draft version and is subject to change after review coordinated by the European Education and Culture Executive Agency (EACEA).*

**Authors:** Federica D’Armini (Adecco/Mylia)

**Editors/Reviewers:** Federica D’Armini (Adecco/Mylia), Pawel Figat (WSCS); Andrzej Zylawski (WSCS); Sabine Boesen – Mariani (Utrecht University of Applied Sciences), Niels Sellings (Digital Europe), Ants Slid (BCS Koolitus), Jutta Breyer (Digital Europe), Paul Aertsen(Global Knowledge)

[softwareskills.eu](https://softwareskills.eu)

## **Legal Disclaimer**

The European Commission’s support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by the  
Erasmus+ Programme  
of the European Union

## **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.

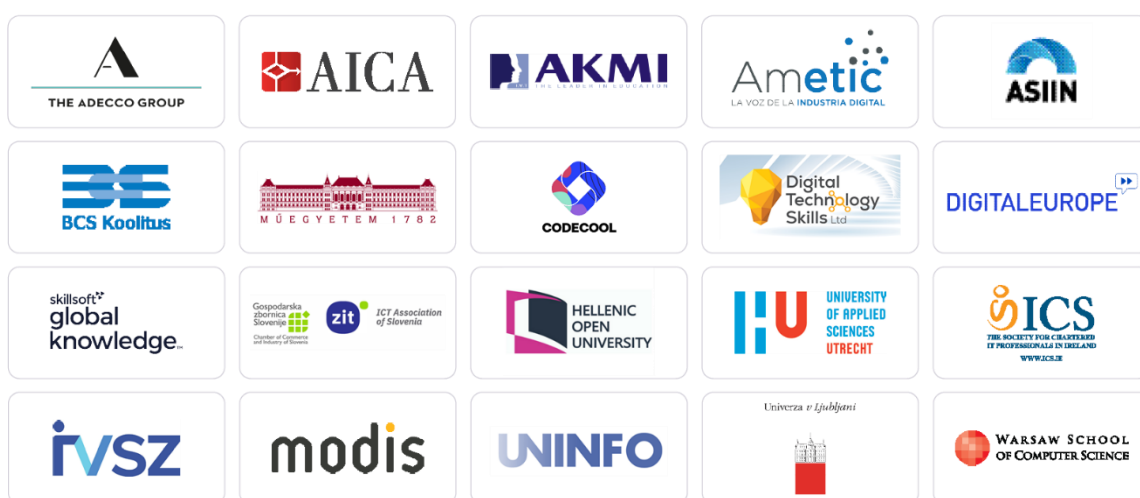
ESSA provides current and future software professionals, learning providers and organisations with software needs with the educational and training instruments they need to meet the demand for software skills in Europe.

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](#)



## Table of Contents

<b>1. How to use the ESSA Learning programme for Developer EQF 7 profile.....</b>	<b>6</b>
<b>1.1 Introduction .....</b>	<b>6</b>
<b>1.2 TARGET .....</b>	<b>6</b>
<b>2. How to deliver the ESSA Developer EQF 7 profile .....</b>	<b>7</b>
<b>2.1 Post graduate students with the purpose to upskill or reskill with developer full stack competences .....</b>	<b>7</b>
2.1.1 Overall Information about the Learning Programme.....	7
2.1.2 Learning Programme PLO 1 – Application Design [e-4] .....	7
2.1.2.1 Learning Units PLO 1 – Application Design [e-4] .....	8
2.1.3 Learning Programme PLO 2 – Application Development [e-4] .....	10
2.1.3.1 Learning Units PLO 2 – Application Development [e-4].....	11
2.1.4 Learning Programme PLO 3 – Component Integration [e-4] .....	12
2.1.4.1 Learning Units PLO 3 – Component Integration [e-4].....	13
2.1.5 Learning Programme PLO 4 – Testing [e-4].....	14
2.1.5.1 Learning Units PLO 4 – Testing [e-4] .....	15
2.1.6 Learning Programme PLO 5 – Profession related competences [EQF7] .....	16
2.1.6.1 Learning Units PLO 5 – Profession related competences [EQF7].....	17
2.1.7 Learning Programme PLO 6 – Soft competences [EQF7].....	17
2.1.7.1 Learning Units PLO 6 – Soft competences [EQF7] .....	19
2.1.8 Learning Programme PLO 7 – Functioning in organisation [EQF7] .....	19
2.1.8.1 Learning Units PLO 7 – Functioning in organisation [EQF7] .....	20
2.1.9 Learning Programme EXTRA CURRICULAR PLO: New Technology [EQF7] .....	21
2.1.9.1 Learning Units PLO New Technology [EQF7] .....	22
<b>2.2 Post graduate students with the purpose to upskill or reskill with developer full stack competences – Developer Database.....</b>	<b>23</b>
2.2.1 Overall Information about the Learning Programme .....	23
2.2.2 Learning Programme PLO 1 – Application Design [e-4] .....	23
2.2.2.1 Learning Units PLO 1 – Application Design [e-4] .....	24
2.2.3 Learning Programme PLO 2 – Application Development [e-4] .....	25
2.2.3.1 Learning Units PLO 2 – Application Development [e-4].....	26
2.2.4 Learning Programme PLO 3 – Component Integration [e-4].....	27
2.2.4.1 Learning Units PLO 3 – Component Integration [e-4].....	28
2.2.5 Learning Programme PLO 4 – Testing [e-4].....	29
2.2.5.1 Learning Units PLO 4 – Testing [e-4] .....	30
2.2.6 Learning Programme PLO 5 – Profession related competences [EQF7] .....	31
2.2.6.1 Learning Units PLO 5 – Profession related competences [EQF7].....	32
2.2.7 Learning Programme PLO 6 – Soft competences [EQF7] .....	33
2.2.7.1 Learning Units PLO 6 – Soft competences [EQF7] .....	34
2.2.8 Learning Programme PLO 7 – Functioning in organisation [EQF7] .....	35
2.2.8.1 Learning Units PLO 7 – Functioning in organisation [EQF7] .....	36
2.2.9 Learning Programme EXTRA CURRICULAR PLO: New Technology [EQF7] .....	36
2.2.9.1 Learning Units PLO New Technology [EQF7] .....	37

## List of abbreviations and acronyms

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

# 1. How to use the ESSA Learning programme for Developer EQF 7 profile

## 1.1 Introduction

In this Annex trainers, teachers and educators are provided with all information necessary to deliver the ESSA Learning Programmes designed for the Developer EQF 7 Educational profile.

The two proposed learning paths follow a modular and flexible structure based on Programme Learning Outcomes (PLOs). Each PLO includes self-consistent Learning Units (LUs) supported by specific learning materials.

In particular, this document provides:

- overall information for Learning Programme - Objective, Total number of Programme Learning Outcomes (PLOs) concerned, Total Learning Units (LUs), Overall duration (hours); Total number of ECTS; Targeted Institutions (learning providers);
- detailed Learning Programme including the Learning Units for each Programme Learning Outcome (PLO).

In this regard, more specifically, the following is provided for each Programme Learning Outcome (PLO):

- overall information (N. of Learning Units, Duration in hours, Total number of ECTS, Recommendations for Micro-credentials, possible integration with studies related to other PLOs, Recommended Didactical Approach, Recommended Delivery methods, etc);
- detailed information for each Learning Unit (Title, Duration in hours, Didactical Approach and delivery method, type of Assessment, Title of the related Learning material proposed, Link to access to the learning material - ESSA Platform).

This Annex is strictly related to the document “Train the Trainer Programme. DELIVERABLE 13 – ESSA Train the Trainer Programme & Materials”.

As a further support, it is advised to consult the documents indicated in the paragraph “Sources of reference” of the Deliverable 13 above mentioned, through the available links.

Learning materials developed to support the delivery of the ESSA Learning Programmes for this Educational Profile are available on the ESSA platform at the following link: <https://learn.softwareskills.eu/>.

## 1.2 TARGET

The following two Learning Programmes address two type of target groups:

- **Post graduate students with the purpose to upskill or reskill with developer full stack competences;**

- Post graduate students with the purpose to upskill or reskill with developer full stack competences – Developer Database.

## 2. How to deliver the ESSA Developer EQF 7 profile

### 2.1 Post graduate students with the purpose to upskill or reskill with developer full stack competences

#### 2.1.1 Overall Information about the Learning Programme

<b>Objective</b>	<i>The programme aims to make participants familiarize with various aspects of advanced programming tasks in the context of frontend and backend development. The course program covers topics related to understanding project requirements and interpreting design documentation, implementing IT solutions using modern techniques, tools, and software development standards. An important element of the course also includes cloud-based approaches and selected aspects related to implementing solutions that require both a team-oriented approach and knowledge of DevOps techniques and solutions</i>
<b>Total number of PLOs concerned</b>	8
<b>Total Learning Units</b>	24
<b>Duration</b>	300 hours
<b>Total number of ECTS</b>	12
<b>Targeted Institutions</b>	Higher Education Institutions

#### 2.1.2 Learning Programme PLO 1 – Application Design [e-4]

Overall information PLO 1 – Application Design [e-4]	
<b>N. of Learning Units</b>	5
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- <i>Assesses needs of customers, users, and stakeholders and formulates requirements and functional specifications, taking into account overall business needs (e.g., by performing a requirements analysis)</i></li> <li>- <i>Specifies a design for an advanced/ innovative solution, software application or component, taking into account specific constraints/ requirements (e.g., related to machine learning, cloud, big data, blockchain, IoT; constraints such as e.g., impact on the organisation/ business/ society; the development environment, programming language, technology, requirements related to performance, security, accessibility, usability, privacy, ethics, safety, IS policy, cost, quality)</i></li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	<i>starting from n.1,5 ECTS</i>

<b>Recommendations for Micro-credentials</b>	<i>This PLO should be an integral part of the advanced studies for students with prior knowledge of software development. Recommended as an independent micro-credential for upskilling developers.</i>
<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture</i> up to 80% <i>Case study. Individual/team project</i> 20 +%
<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	<i>After learning the basic principles, terminology, and models of software design, the study should focus on analysing and simulating real work-life-like tasks as, for example:</i> <ul style="list-style-type: none"> <li>• <i>Implementation of Business/Industry Projects</i></li> <li>• <i>Industry practitioner - led session</i></li> </ul>
<b>Important (new) approaches and technologies to consider</b>	<i>Not Applicable</i>
<b>Training facilities (Link to ESSA learning material Platform)</b>	<i><a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a></i>

### 2.1.2.1 Learning Units PLO 1 – Application Design [e-4]

LU1	Software engineering I: Software modelling and architecture
<b>Duration</b>	<i>1,5 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>Modelling and analysis of information systems Advanced Software Engineering Design Patterns and Architectural Applications</i>



<b>LU2</b>	<b>Software engineering II: DevOps</b>
<b>Duration</b>	1,5 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/Project
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	Software engineering II: DevOps/ Methods and Tools for CI & CD in Software Development Processes

<b>LU3</b>	<b>Software development methods and paradigms II: Object-oriented</b>
<b>Duration</b>	3 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/Project
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	Advanced Object-Oriented Design Concurrent Programming Unit Testing

<b>LU4</b>	<b>Software development methods and paradigms III: Internet software development</b>
<b>Duration</b>	3 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/Project
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	Application and Website Design Creating Applications and Websites (I) Creating Applications and Websites (II)

<b>LU5</b>	<b>Cloud-based software development</b>
<b>Duration</b>	1,5 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/Project

<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment</i>
<b>Title of the Learning material</b>	<i>Cloud-based software development /Creating Cloud Applications Cloud Service Management</i>

### 2.1.3. Learning Programme PLO 2 – Application Development [e-4]

Overall information PLO 2 - Application Development [e-4]	
<b>N. of Learning Units</b>	4
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- <i>Writes complex code and related documentation to it, taking into account relevant principles and constraints</i></li> <li>- <i>Creates an advanced/ innovative working software component or application, that satisfies its requirements, applying complex techniques and tools (e.g., embedded software, cloud-based applications; related to e.g., machine learning, cloud, big data, blockchain, IoT)</i></li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	<i>starting from n.2,5 ECTS</i>
<b>Recommendations for Micro-credentials</b>	<i>This PLO should be an integral part of the advanced studies for students with prior knowledge of software development. Recommended as an independent micro-credential for upskilling developers.</i>
<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture up to 80%</i> <i>Case study. Individual/team project 20+%</i>
<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	<i>n/a</i>
<b>Important (new) approaches and technologies to consider</b>	<i>n/a</i>

<b>Training facilities (Link to ESSA learning material Platform)</b>	<a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a>
--	---

### 2.1.3.1 Learning Units PLO 2 – Application Development [e-4]

<b>LU1</b>	<b>Software development methods and paradigms I: Fundamentals of programming and algorithms</b>
<b>Duration</b>	2,5 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/ Practical assignment
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	Foundations and Programming Methods Creating Applications Using Integrated Development Environments

<b>LU2</b>	<b>Software development methods and paradigms II: Object-oriented programming</b>
<b>Duration</b>	3 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/ Project
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	Advanced Object-Oriented Design Concurrent Programming Unit Testing

<b>LU3</b>	<b>Software development methods and paradigms III: Internet software development</b>
<b>Duration</b>	3 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/ Project
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	Application and Website Design Creating Applications and Websites (I) Creating Applications and Websites (II)

<b>LU4</b>	<b>Cloud-based software development</b>
<b>Duration</b>	1,5 ECTS

<b>Didactical Approach and delivery method</b>	<i>Lecture/ Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>Cloud-based software development /Creating Cloud Applications Cloud Service Management</i>

## 2.1.4 Learning Programme PLO 3 – Component Integration [e-4]

Overall information PLO 3 – Component Integration [e-4]	
<b>N. of Learning Units</b>	3
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- <i>Creates and guides a process for integration of an advanced/ innovative solution, software application or component (e.g., proposes standards of practice; for a solution related to e.g., machine learning, cloud, big data, blockchain, IoT)</i></li> <li>- <i>Writes a report/ advisory report/ paper/ research article on integration of a solution or software application in an innovative/ advanced/ complex situation (e.g., an analysis of software integration challenges related to a particular technology or method, a process/HR/internal standards design for an integration cycle, a resource assignment plan)</i></li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	<i>starting from n. 1,5 ECTS</i>
<b>Recommendations for Micro-credentials</b>	<i>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 junior developers.</i>
<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture up to 80%</i> <i>Case study. Individual/team project 20+%</i>
<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task</b>	<i>n/a</i>

<b>(If foreseen) and Follow-up, learning reinforcement</b>	
<b>Important (new) approaches and technologies to consider</b>	<i>n/a</i>
<b>Training facilities (Link to ESSA learning material Platform)</b>	<a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a>

### 2.1.4.1 Learning Units PLO 3 – Component Integration [e-4]

<b>LU1</b>	<b>Software development methods and paradigms II: Object-oriented programming</b>
<b>Duration</b>	<i>3 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/ Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>Advanced Object-Oriented Design Concurrent Programming Unit Testing</i>

<b>LU2</b>	<b>Software development methods and paradigms III: Internet software development</b>
<b>Duration</b>	<i>3 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/ Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>Application and Website Design Creating Applications and Websites (I) Creating Applications and Websites (II)</i>

<b>LU3</b>	<b>Software engineering II: DevOps</b>
<b>Duration</b>	<i>1,5 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/ Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>

<b>Title of the Learning material</b>	<i>Software engineering II DevOps/ Methods and Tools for CI &amp; CD in Software Development Processes</i>
---------------------------------------	--

## 2.1.5 Learning Programme PLO 4 – Testing [e-4]

<b>Overall information PLO 4 – Testing [e-4]</b>	
<b>N. of Learning Units</b>	4
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- <i>Creates and guides a process for testing an advanced/ innovative solution, software application or component (e.g., proposes standards of practice; for a solution related to e.g., machine learning, cloud, big data, blockchain, IoT)</i></li> <li>- <i>Writes a report/ advisory report/ paper/ research article on a topic related to testing of an innovative/ advanced/ complex solution, software application or component or on issues regarding testing in specific situations (e.g., agile testing, a process design for an entire testing activity, specification of internal standards of practice for testing, test management plan for CI testing)</i></li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	<i>starting from n.1,5 ECTS</i>
<b>Recommendations for Micro-credentials</b>	<i>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 developers.</i>
<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture</i> up to 80% <i>Case study. Individual/team project</i> 20+%
<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	<i>n/a</i>
<b>Important (new) approaches and technologies to consider</b>	<i>n/a</i>

<b>Training facilities (Link to ESSA learning material Platform)</b>	<a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a>
--	---

### 2.1.5.1 Learning Units PLO 4 – Testing [e-4]

<b>LU1</b>	<b>Software development methods and paradigms II: Object-oriented programming</b>
<b>Duration</b>	3 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/ Project
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	Advanced Object-Oriented Design Concurrent Programming Unit Testing

<b>LU2</b>	<b>Software development methods and paradigms III: Internet software development</b>
<b>Duration</b>	3 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/ Project
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	Application and Website Design Creating Applications and Websites (I) Creating Applications and Websites (II)

<b>LU3</b>	<b>Software development methods and paradigms III: Internet software development</b>
<b>Duration</b>	1,5 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/ Project
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	Software engineering II DevOps/ Methods and Tools for CI & CD in Software Development Processes

<b>LU4</b>	<b>Cloud-based software development</b>
<b>Duration</b>	1,5 ECTS

<b>Didactical Approach and delivery method</b>	<i>Lecture/ Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>Cloud-based software development /Creating Cloud Applications Cloud Service Management</i>

## 2.1.6 Learning Programme PLO 5 – Profession related competences [EQF7]

Overall information PLO 5 – Profession related competences [EQF7]	
<b>N. of Learning Units</b>	1
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- <i>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.</i></li> <li>- <i>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</i></li> <li>- <i>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</i></li> <li>- <i>Is continuously aware of ethical considerations and issues and applies these in professional context 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</i></li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	<i>starting from n. 1,5 ECTS</i>
<b>Recommendations for Micro-credentials</b>	<i>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 developers.</i>
<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture</i> up to 80% <i>Case study. Individual/team project</i> 20 + %



<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	<i>n/a</i>
<b>Important (new) approaches and technologies to consider</b>	<i>n/a</i>
<b>Training facilities (Link to ESSA learning material Platform)</b>	<i><a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a></i>

### 2.1.6.1 Learning Units PLO 5 – Profession related competences [EQF7]

LU1	Fundamentals of Law for IT
<b>Duration</b>	<i>1 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/ Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment</i>
<b>Title of the Learning material</b>	<i>Fundamentals of Law for IT</i>

### 2.1.7 Learning Programme PLO 6 – Soft competences [EQF7]

Overall information PLO 6 – Soft competences [EQF7]	
<b>N. of Learning Units</b>	<i>3</i>
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- <i>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</i></li> <li>- <i>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</i></li> </ul>

	<p>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.</p> <ul style="list-style-type: none"> <li>- 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.</li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	starting from n.1 ECTS
<b>Recommendations for Micro-credentials</b>	<p>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 junior developers.</p>
<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	<p>Presence Classroom Virtual Classroom Blended</p>
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<p>Lecture up to 80% Case study. Individual/team project 20 + %</p>
<b>Additional comments</b>	<p>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.</p>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	n/a
<b>Important (new) approaches and technologies to consider</b>	n/a
<b>Training facilities (Link to ESSA learning material Platform)</b>	<a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a>

### 2.1.7.1 Learning Units PLO 6 – Soft competences [EQF7]

LU1	Fundamentals of Agile Team Management
Duration	1 ECTS
Didactical Approach and delivery method	Lecture/ Practical assignment
Additional information	Blended
Assessment	Practical assignment
Title of the Learning material	Fundamentals of Agile Team Management

LU2	Diploma thesis design
Duration	5 ECTS
Didactical Approach and delivery method	Lecture/ Practical assignment
Additional information	Blended
Assessment	Diploma exam
Title of the Learning material	Diploma thesis design

LU3	Fundamentals of Law for IT
Duration	1 ECTS
Didactical Approach and delivery method	Lecture/ Practical assignment
Additional information	Blended
Assessment	Practical assignment
Title of the Learning material	Fundamentals of Law for IT

### 2.1.8 Learning Programme PLO 7 – Functioning in organisation [EQF7]

Overall information PLO 7 – Functioning in organisations [EQF7]	
N. of Learning Units	2
Learning Outcomes	<ul style="list-style-type: none"> <li>- Explains organisation theory and behaviour</li> <li>- Describes the relationship between business and IT</li> <li>- 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</li> <li>- Leads a project</li> </ul>

	- <i>Writes a report on functioning in organisation</i>
<b>Duration</b>	-
<b>Total number of ECTS</b>	<i>starting from n.1 ECTS</i>
<b>Recommendations for Micro-credentials</b>	<i>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 junior developers.</i>
<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture up to 80%</i> <i>Case study. Individual/team project 20 + %</i>
<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	<i>n/a</i>
<b>Important (new) approaches and technologies to consider</b>	<i>n/a</i>
<b>Training facilities (Link to ESSA learning material Platform)</b>	<i><a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a></i>

### 2.1.8.1. Learning Units PLO 7 – Functioning in organisation [EQF7]

LU1	Fundamentals of Law for IT
<b>Duration</b>	<i>1 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/ Practical assignment</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment</i>
<b>Title of the Learning material</b>	<i>Fundamentals of Law for IT</i>

<b>LU2</b>	<b>Fundamentals of Agile Team Management</b>
<b>Duration</b>	1 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/ Practical assignment
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment
<b>Title of the Learning material</b>	Fundamentals of Agile Team Management

## 2.1.9 Learning Programme EXTRA CURRICULAR PLO: New Technology [EQF7]

Overall information PLO New Technology [EQF7]	
<b>N. of Learning Units</b>	2
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- 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)</li> <li>- Writes a critical reflection on a new technology</li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	starting from n.1,5 ECTS
<b>Recommendations for Micro-credentials</b>	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 junior developers.
<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	Lecture up to 80% Case study. Individual/team project 20 + %
<b>Additional comments</b>	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.
<b>Work Based Learning Task</b>	n/a

<b>(If foreseen) and Follow-up, learning reinforcement</b>	
<b>Important (new) approaches and technologies to consider</b>	<i>n/a</i>
<b>Training facilities (Link to ESSA learning material Platform)</b>	<a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a>

### 2.1.9.1 Learning Units PLO New Technology [EQF7]

<b>LU1</b>	<b>Software development methods and paradigms III: Internet software development</b>
<b>Duration</b>	<i>3 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment/Exam</i>
<b>Title of the Learning material</b>	<i>Application and Website Design Creating Applications and Websites (I) Creating Applications and Websites (II)</i>

<b>LU2</b>	<b>Cloud-based software development</b>
<b>Duration</b>	<i>1,5 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/ Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment</i>
<b>Title of the Learning material</b>	<i>Cloud-based software development/Creating Cloud Applications, Cloud Service Management</i>

## 2.2 Post graduate students with the purpose to upskill or reskill with developer full stack competences – Developer Database

### 2.2.1 Overall Information about the Learning Programme

<b>Objective</b>	<i>The programme aims to make participants familiarize with various aspects of programming tasks in the context of databases. The course program covers issues of database design and implementation, database administration, database object programming in T-SQL or CLR. An important element of the course are issues related to the use of data in advanced analytical tasks implemented in R and Python.</i>
<b>Total number of PLOs concerned</b>	8
<b>Total Learning Units</b>	22
<b>Duration</b>	337,5 hours
<b>Total number of ECTS</b>	13,5
<b>Targeted Institutions</b>	Higher Education Institutions

### 2.2.2 Learning Programme PLO 1 – Application Design [e-4]

Overall information PLO 1 – Application Design [e-4]	
<b>N. of Learning Units</b>	4
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- <i>Assesses needs of customers, users, and stakeholders and formulates requirements and functional specifications, taking into account overall business needs (e.g., by performing a requirements analysis)</i></li> <li>- <i>Specifies a design for an advanced/ innovative solution, software application or component, taking into account specific constraints/ requirements (e.g., related to machine learning, cloud, big data, blockchain, IoT; constraints such as e.g., impact on the organisation/ business/ society; the development environment, programming language, technology, requirements related to performance, security, accessibility, usability, privacy, ethics, safety, IS policy, cost, quality)</i></li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	<i>starting from n.2 ECTS</i>
<b>Recommendations for Micro-credentials</b>	<i>This PLO should be an integral part of the advanced studies for students with prior knowledge of software development. Recommended as an independent micro-credential for upskilling developers.</i>
<b>Often integrated with studies of PLO</b>	-

<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture</i> up to 80% <i>Case study. Individual/team project</i> 20 +%
<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	<i>After learning the basic principles, terminology, and models of software design, the study should focus on analysing and simulating real work-life-like tasks as, for example:</i> <ul style="list-style-type: none"> <li>• <i>Implementation of Business/Industry Projects</i></li> <li>• <i>Industry practitioner - led session</i></li> </ul>
<b>Important (new) approaches and technologies to consider</b>	n/a
<b>Training facilities (Link to ESSA learning material Platform)</b>	<a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a>

### 2.2.2.1 Learning Units PLO 1 – Application Design [e-4]

LU1	Databases
<b>Duration</b>	2,5 ECTS
<b>Didactical Approach and delivery method</b>	<i>Lecture/Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>Fundamentals and design of relational databases SQL Queries</i>

LU2	Database management systems administration
<b>Duration</b>	3 ECTS
<b>Didactical Approach and delivery method</b>	<i>Lecture/Project</i>



<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>Azure DB</i>

<b>LU3</b>	<b>Data encryption and security</b>
<b>Duration</b>	<i>2 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>T-SQL language with cryptography elements Database administration</i>

<b>LU4</b>	<b>Data mining</b>
<b>Duration</b>	<i>3,5 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>Statistical basis of data processing/Data processing and visualization with Python language</i>

### 2.2.3 Learning Programme PLO 2 – Application Development [e-4]

<b>Overall information PLO 2 - Application Development [e-4]</b>	
<b>N. of Learning Units</b>	<i>4</i>
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- <i>Writes complex code and related documentation to it, taking into account relevant principles and constraints</i></li> <li>- <i>Creates an advanced/ innovative working software component or application, that satisfies its requirements, applying complex techniques and tools (e.g., embedded software, cloud-based applications; related to e.g., machine learning, cloud, big data, blockchain, IoT)</i></li> </ul>
<b>Duration</b>	<i>-</i>
<b>Total number of ECTS</b>	<i>starting from n.2 ECTS</i>

<b>Recommendations for Micro-credentials</b>	<i>This PLO should be an integral part of the advanced studies for students with prior knowledge of software development. Recommended as an independent micro-credential for upskilling developers.</i>
<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture up to 80%</i> <i>Case study. Individual/team project 20+%</i>
<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	n/a
<b>Important (new) approaches and technologies to consider</b>	n/a
<b>Training facilities (Link to ESSA learning material Platform)</b>	<a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a>

### 2.2.3.1 Learning Units PLO 2 – Application Development [e-4]

<b>LU1</b>	<b>Databases</b>
<b>Duration</b>	2,5 ECTS
<b>Didactical Approach and delivery method</b>	<i>Lecture/Practical assignment</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>Fundamentals and design of relational databases SQL Queries</i>

<b>LU2</b>	<b>Data encryption and security</b>
------------	-------------------------------------

<b>Duration</b>	2 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/Project
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	T-SQL language with cryptography elements Database administration

<b>LU3</b>	<b>Object-relational mapping</b>
<b>Duration</b>	3 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/Project
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	An introduction to ORM Advanced ORM tools and techniques

<b>LU4</b>	<b>Data mining</b>
<b>Duration</b>	3,5 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/Project
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	Statistical basis of data processing Data processing and visualization with Python language

## 2.2.4 Learning Programme PLO 3 – Component Integration [e-4]

<b>Overall information PLO 3 – Component Integration [e-4]</b>	
<b>N. of Learning Units</b>	2
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- Creates and guides a process for integration of an advanced/ innovative solution, software application or component (e.g., proposes standards of practice; for a solution related to e.g., machine learning, cloud, big data, blockchain, IoT)</li> </ul>

	- <i>Writes a report/ advisory report/ paper/ research article on integration of a solution or software application in an innovative/ advanced/ complex situation (e.g., an analysis of software integration challenges related to a particular technology or method, a process/HR/internal standards design for an integration cycle, a resource assignment plan)</i>
<b>Duration</b>	-
<b>Total number of ECTS</b>	<i>starting from n. 2 ECTS</i>
<b>Recommendations for Micro-credentials</b>	<i>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 junior developers.</i>
<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture</i> up to 80% <i>Case study. Individual/team project</i> 20+%
<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	<i>n/a</i>
<b>Important (new) approaches and technologies to consider</b>	<i>n/a</i>
<b>Training facilities (Link to ESSA learning material Platform)</b>	<i><a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a></i>

#### 2.2.4.1 Learning Units PLO 3 – Component Integration [e-4]

<b>LU1</b>	<b>Data encryption and security</b>
<b>Duration</b>	<i>2 ECTS</i>

<b>Didactical Approach and delivery method</b>	<i>Lecture/Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>T-SQL language with cryptography elements Database administration</i>

<b>LU2</b>	<b>Object-relational mapping</b>
<b>Duration</b>	<i>3 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>An introduction to ORM Advanced ORM tools and techniques</i>

## 2.2.5 Learning Programme PLO 4 – Testing [e-4]

<b>Overall information PLO 4 – Testing [e-4]</b>	
<b>N. of Learning Units</b>	3
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- <i>Creates and guides a process for testing an advanced/ innovative solution, software application or component (e.g., proposes standards of practice; for a solution related to e.g., machine learning, cloud, big data, blockchain, IoT)</i></li> <li>- <i>Writes a report/ advisory report/ paper/ research article on a topic related to testing of an innovative/ advanced/ complex solution, software application or component or on issues regarding testing in specific situations (e.g., agile testing, a process design for an entire testing activity, specification of internal standards of practice for testing, test management plan for CI testing)</i></li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	<i>starting from n. 2 ECTS</i>
<b>Recommendations for Micro-credentials</b>	<i>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 developers.</i>
<b>Often integrated with studies of PLO</b>	-

<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture</i> up to 80% <i>Case study. Individual/team project</i> 20+%
<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	n/a
<b>Important (new) approaches and technologies to consider</b>	n/a
<b>Training facilities (Link to ESSA learning material Platform)</b>	<a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a>

### 2.2.5.1 Learning Units PLO 4 – Testing [e-4]

<b>LU1</b>	<b>Database management systems administration</b>
<b>Duration</b>	3 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/Project
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment exam
<b>Title of the Learning material</b>	NoSQL systems Azure DB

<b>LU2</b>	<b>Data encryption and security</b>
<b>Duration</b>	2 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/Project

<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>T-SQL language with cryptography elements Database administration</i>

<b>LU3</b>	<b>Object-relational mapping</b>
<b>Duration</b>	<i>3 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>
<b>Title of the Learning material</b>	<i>An introduction to ORM Advanced ORM tools and techniques</i>

## 2.2.6 Learning Programme PLO 5 – Profession related competences [EQF7]

<b>Overall information PLO 5 – Profession related competences [EQF7]</b>	
<b>N. of Learning Units</b>	2
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- <i>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.</i></li> <li>- <i>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</i></li> <li>- <i>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</i></li> <li>- <i>Is continuously aware of ethical considerations and issues and applies these in professional context 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</i></li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	<i>starting from n. 1 ECTS</i>
<b>Recommendations for Micro-credentials</b>	<i>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 developers.</i>
<b>Often integrated with studies of PLO</b>	-

<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture</i> up to 80% <i>Case study. Individual/team project</i> 20 + %
<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	n/a
<b>Important (new) approaches and technologies to consider</b>	n/a
<b>Training facilities (Link to ESSA learning material Platform)</b>	<a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a>

### 2.2.6.1 Learning Units PLO 5 – Profession related competences [EQF7]

<b>LU1</b>	<b>Fundamentals of Law for IT</b>
<b>Duration</b>	1 ECTS
<b>Didactical Approach and delivery method</b>	<i>Lecture/ Practical assignment</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment</i>
<b>Title of the Learning material</b>	<i>Fundamentals of Law for IT</i>
<b>LU2</b>	<b>Data encryption and security</b>
<b>Duration</b>	2 ECTS
<b>Didactical Approach and delivery method</b>	<i>Lecture/Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment exam</i>



<b>Title of the Learning material</b>	<i>T-SQL language with cryptography elements Database administration</i>
---------------------------------------	--

## 2.2.7 Learning Programme PLO 6 – Soft competences [EQF7]

<b>Overall information PLO 6 – Soft competences [EQF7]</b>	
<b>N. of Learning Units</b>	3
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- <i>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</i></li> <li>- <i>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.</i></li> <li>- <i>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.</i></li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	<i>starting from n.1 ECTS</i>
<b>Recommendations for Micro-credentials</b>	<i>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 junior developers.</i>
<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture up to 80%</i> <i>Case study. Individual/team project 20 + %</i>

<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	<i>n/a</i>
<b>Important (new) approaches and technologies to consider</b>	<i>n/a</i>
<b>Training facilities (Link to ESSA learning material Platform)</b>	<i><a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a></i>

### 2.2.7.1 Learning Units PLO 6 – Soft competences [EQF7]

<b>LU1</b>	<b>Fundamentals of Agile Team Management</b>
<b>Duration</b>	<i>1 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/ Practical assignment</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment</i>
<b>Title of the Learning material</b>	<i>Fundamentals of Agile Team Management</i>

<b>LU2</b>	<b>Fundamentals of Law for IT</b>
<b>Duration</b>	<i>1 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/ Practical assignment</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment</i>
<b>Title of the Learning material</b>	<i>Fundamentals of Law for IT</i>

<b>LU3</b>	<b>Diploma thesis design</b>
<b>Duration</b>	<i>5 ECTS</i>
<b>Didactical Approach and delivery method</b>	<i>Lecture/ Practical assignment</i>
<b>Additional information</b>	<i>Blended</i>

<b>Assessment</b>	<i>Diploma exam</i>
<b>Title of the Learning material</b>	<i>Diploma thesis design</i>

## 2.2.8 Learning Programme PLO 7 – Functioning in organisation [EQF7]

Overall information PLO 7 – Functioning in organisations [EQF7]	
<b>N. of Learning Units</b>	2
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- <i>Explains organisation theory and behaviour</i></li> <li>- <i>Describes the relationship between business and IT</i></li> <li>- <i>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</i></li> <li>- <i>Leads a project</i></li> <li>- <i>Writes a report on functioning in organisation</i></li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	<i>starting from n.1 ECTS</i>
<b>Recommendations for Micro-credentials</b>	<i>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 junior developers.</i>
<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture</i> up to 80% <i>Case study. Individual/team project</i> 20 + %
<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	<i>n/a</i>
<b>Important (new) approaches and technologies to consider</b>	<i>n/a</i>

<b>Training facilities (Link to ESSA learning material Platform)</b>	<a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a>
--	---

### 2.2.8.1 Learning Units PLO 7 – Functioning in organisation [EQF7]

LU1	Fundamentals of Agile Team Management
<b>Duration</b>	1 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/ Practical assignment
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment
<b>Title of the Learning material</b>	Fundamentals of Agile Team Management

LU2	Fundamentals of Law for IT
<b>Duration</b>	1 ECTS
<b>Didactical Approach and delivery method</b>	Lecture/ Practical assignment
<b>Additional information</b>	Blended
<b>Assessment</b>	Practical assignment
<b>Title of the Learning material</b>	Fundamentals of Law for IT

### 2.2.9 Learning Programme EXTRA CURRICULAR PLO: New Technology [EQF7]

Overall information PLO New Technology [EQF7]	
<b>N. of Learning Units</b>	2
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>- 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)</li> <li>- Writes a critical reflection on a new technology</li> </ul>
<b>Duration</b>	-
<b>Total number of ECTS</b>	starting from n. 2,5 ECTS
<b>Recommendations for Micro-credentials</b>	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 junior developers.

<b>Often integrated with studies of PLO</b>	-
<b>Recommended Didactical Approach</b>	Presence Classroom Virtual Classroom Blended
<b>Additional comments</b>	-
<b>Recommended Delivery methods</b>	<i>Lecture</i> up to 80% <i>Case study. Individual/team project</i> 20 + %
<b>Additional comments</b>	<i>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.</i>
<b>Work Based Learning Task (If foreseen) and Follow-up, learning reinforcement</b>	n/a
<b>Important (new) approaches and technologies to consider</b>	n/a
<b>Training facilities (Link to ESSA learning material Platform)</b>	<a href="https://learn.softwareskills.eu/">https://learn.softwareskills.eu/</a>

### 2.2.9.1 Learning Units PLO New Technology [EQF7]

LU1	Databases
<b>Duration</b>	2,5 ECTS
<b>Didactical Approach and delivery method</b>	<i>Lecture/ Project</i>
<b>Additional information</b>	<i>Blended</i>
<b>Assessment</b>	<i>Practical assignment/ Exam</i>
<b>Title of the Learning material</b>	<i>Fundamentals and design of relational databases SQL Queries</i>

LU1	Data mining
<b>Duration</b>	3,5 ECTS
<b>Didactical Approach and delivery method</b>	<i>Lecture/ Project</i>
<b>Additional information</b>	<i>Blended</i>

<b>Assessment</b>	<i>Practical assignment</i>
<b>Title of the Learning material</b>	<i>Statistical basis of data processing Data processing and visualization with Python language</i>

[www.softwareskills.eu](http://www.softwareskills.eu)



Co-funded by the  
Erasmus+ Programme  
of the European Union

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.