

European Software Skills Alliance.

EDUCATIONAL PROFILE

ESSA Junior DevOps expert EQF 6

This educational profile belongs to the field of Software Engineering and is covered by relevant references in EN 16234-1:2019 (e-CF) and ISO/IEC/IEEE 90003:2018.

DevOps experts create an efficient cooperation and workflow between software development and IT operations to accelerate delivery and enhance quality of solutions and services. In this way, time is reduced between committing a change to a system and the change being placed into the production environment. DevOps experts strive for a continuous deployment and apply specific methods, practices, and tools, such as agile ways of working, shared ownership, and workflow automation.

DevOps experts at Bachelor level develop, test, and deploy solutions in close collaboration with the operations team and take into account the multi-disciplinarity of the context. They account for others' development activities.

Learn more:

About this profile	2
Competences.....	2
Deliverables	2
Professional perspectives.....	3
Educational perspectives	3
Programme Learning Outcomes (PLO)	4
Assessments	7

The Erasmus+ project ESSA (European Software Skills Alliance) aims to skill, upskill, and reskill individuals into high-demand software roles across the EU.



About this profile



This profile is for educating people, with or without previous ICT knowledge, to implement processes and tools to successfully deploy DevOps techniques across the entire solution development lifecycle.

The profile has an EQF 6 level. No prior knowledge on the topic is required.

This level requires:

- **Autonomy:** Works independently under broad direction to solve problems. Has a positive effect on team performance.
- **Context:** Structured – unpredictable context, vague problems, open approach and solution space.
- **Content:** Combination of multiple concepts for advancement and innovation in the local situation.

Competences

e-CF competences (incl. e-CF level)	General competences (incl. EQF level)
B.1. Application Development [e-3]	P. Profession-related competences (EQF6)
B.2. Component Integration [e-3]	I.S. Interpersonal soft competences (EQF6)
B.3. Testing [e-3]	P.S. Personal soft competences (EQF6)
B.4. Solution Deployment [e-3]	F.O. Functioning in organisations (EQF6)
B.6. ICT Systems Engineering [e-3]	
C.2. Change Support [e-3]	

Deliverables

Learners should master the following deliverables:

- A structured dataset
- Code and related documentation
- Working software component/ application
- Modified existing software component/ application
- Integrated solution
- Installation report
- (Automated) test
- Configured test environment
- Test result documentation/ test report
- Release plan
- Data management/migration plan
- (Parts of) release documentation
- Proposal for improvements to an existing system infrastructure
- (Parts of) a DevOps pipeline
- Change request/proposal
- Report on the application of a method, technique or tool related to a new technology
- Overall project plan for the design/development of an application or software component
- Self-reflection report
- Report on functioning in an organisation

Professional perspectives

Upon completing this programme, the learner is eligible to apply for **junior DevOps positions**, for example as a DevOps team member.

Educational perspectives

After completing this programme, the learner may continue in a **Master's Developer programme** with a focus on more complex and specific application technologies and architectures.

The learner also has a proper base for more advanced training and certification such as Specific programming languages (e.g., Java, Python, C++) - Cybersecurity - Data analytics - Blockchain - Machine Learning/AI - IoT/Automation/Robotics - Testing

Programme Learning Outcomes (PLO)

1. PLO Application Development [e-3]

The learner has demonstrated capability

→ to creatively develop software applications and components, by interpreting the software design

→ to optimise the application development

Unit learning outcomes	Organises data and creates a structured dataset
	Writes code and related documentation to it, using programming languages (e.g., Java, Javascript, PHP, Python) and tools (e.g., GitHub), applying programming principles (e.g., clean coding, green coding, secure programming) and other relevant practices (e.g. continuous integration, test-driven development), principles or constraints (e.g., privacy legislation, intellectual property law)
	Efficiently creates a working software component/ application taking into account design requirements (e.g., scalability, availability) and other relevant constraints (e.g., architecture, efficiency, cost, quality, energy consumption) and applying relevant tools and techniques (e.g., object-oriented programming; IDE, CASE; editors, compilers; version control management and tools; multimedia integration tools; app development tools; reuse of proved solutions)
	Modifies an existing software component/ application , in order to optimise it (e.g., to improve scalability, maintenance, performance, security)

2. PLO Component Integration [e-3]

The learner has demonstrated capability

→ to integrate efficiently a software application or component into an existing system, compliant with standards and procedures

→ to document the installation activities

Unit learning outcomes	Integrates a solution, software application or component applying relevant practices, methods, techniques and tools, compliant with appropriate standards and procedures (e.g. configuration management, version management, change control, packaging and distribution, virtualisation, containerisation)
	Monitors, verifies and tests system capacity and performance, using appropriate techniques and tools
	Writes an installation report/ installation documentation

3. PLO Testing [e-3]

The learner has demonstrated capability

→ to construct and execute tests for solutions, software applications or components

→ to document test outcomes

Unit learning outcomes	Writes (parts of) test related documentation (e.g. test plan, test strategy/approach, test case, test script, test scenario, test conditions)
	Constructs tests , by selecting appropriate test methods, techniques, and tools (e.g. test automation tools)
	Defines and configures a test environment
	Executes test cases and performs test activities related to different sorts of tests
	Records and interprets test outcomes and writes test result documentation/ test report

4. PLO Solution Deployment [e-3]

The learner has demonstrated capability

→ to implement solutions and services

→ to complete release documentation

Unit learning outcomes	Writes a release plan (e.g., including solution verification and validation, documentation, supporting activities; deployment workflow and product roll-out activities)
	Writes a plan for data management/ migration
	Executes (parts of) a solution/ software release, applying appropriate methods, techniques, and tools (e.g., CI/CD tools; tools related to automated software release, software packaging and distribution)
	Writes (parts of) release documentation

5. PLO ICT Systems Engineering [e-3]

The learner has demonstrated capability

→ to create a system infrastructure that meets requirements

→ to ensure interoperability of system components

Unit learning outcomes	Describes software and hardware components, tools and architectures, including network components, topologies, protocols and interconnections
	Analyses existing system infrastructures, applying appropriate methods, techniques, and tools (e.g. related to interoperability of components, security, energy consumption)
	Proposes improvements to an existing system infrastructure , to better meet requirements (e.g., cloud solutions, Infrastructure as Code, Containers as a Service, virtual machines, load balancers)
	Designs (parts of) a DevOps pipeline , by formulating a set of practices and tools that the development and operations teams may implement to build, test, and deploy software

6. Change support [e-3]

The learner has demonstrated capability

→ to oversee and control system changes

→ to take into account procedures, requirements and restrictions

Unit learning outcomes	Describes, distinguishes, and applies change management methods, tools and techniques
	Proposes and applies appropriate and efficient practices, measures and procedures to handle change and to reduce the impact of change (e.g., based on ITIL Change management, DevOps)
	Writes a change request/ change proposal (for addition, modification or removal of a service or software application/component) (e.g., describing benefit, risk, and impact of change, taking into account requirements and restrictions such as information security regulations, budget, SLA, conditions for system integrity)

7. PLO Profession related competences [EQF6]

The learner has demonstrated capability

→ to apply profession related skills

Unit learning outcomes	Masters common ICT knowledge
	Explains the principles, related concepts, advantages, disadvantages, limitations and possible societal, environmental, and ethical issues related to the application of a new technology . Applies and reports on basic methods, techniques and tools related to a new technology.
	Applies, evaluates, reports and provides advice on security standards, regulations, measures, methods, tools, and techniques

Applies, evaluates and provides advice on appropriate methods, tools and techniques related to **software lifecycle processes**

Applies, evaluates, reports and provides advice on **sustainability** standards, regulations, measures, and methods.

Is aware of **ethical considerations** and issues and applies these in professional context and activities. Forms and communicates an opinion based on considerations of relevant social, professional, scientific and ethical aspects

8. PLO Soft competences [EQF6]

The learner has demonstrated capability

→ to apply soft skills

Unit learning outcomes	Manages teamwork processes and facilitates collaboration to reach common objectives, e.g., handles conflicts, negotiates, motivates, and persuades.
	Communicates with peers, colleagues, supervisors and or relevant other, specialists and non- specialists, and clients, appropriately to the scientific and professional community, using conventions which are relevant. Applies communication to the objective and the target group.
	Masters the English language at a level B2. Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation
	Related to the occupation and knowledge domain, critically collects detailed professional and/or scientific information on a limited range of basic theories, principles and concepts, as well as limited information on some important current issues and topics. Analyses , evaluates, and combines critically this information, knowledge and insights and presents this. Critically applies/ translates/ interprets results of research (possibly executed by others) to the own context (the occupation and/or knowledge domain). Executes applied and practice-oriented research.
	Identifies and analyses complex and unpredictable problems Solves these problems in a tactical, strategic and creative way by selecting and using data and by using one's creativity, flexibility and inventiveness.
	Exercises self-management in complex technical or professional activities or projects, taking responsibility for decision making in unpredictable work or study contexts. Is able to cope with change (positive or negative) and to adapt to a considerable level of variety in the workplace. Handles pressure and setbacks and maintains composure. Shows initiative, creativity and some 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 on one's own initiative, by reflecting on and evaluating personal (learning) results. Selects and uses training/instructional methods and procedures appropriate for the situation when learning.

9. PLO Functioning in organisations [EQF6]

The learner has demonstrated capability

→ to function in an organisational context

Unit learning outcomes	Explains the basics of organisation theory and behaviour
	Describes the relationship between business and IT
	Works in an organisational context under specific direction with limited autonomy and responsibility e.g., at the level of a trainee, junior or assistant
	Manages a project, selects appropriate project management methods and tools
	Writes a report on functioning in organisation

Assessments

Unit learning outcome	Assessment method	Validation of prior acquired competences (skills and knowledge)
1.1	Practical assignment	Assessment (of skills)
1.2	Practical assignment	Assessment (of skills)
1.3	Practical assignment	Assessment (of skills)
1.4	Practical assignment	Assessment (of skills)
2.1	Practical assignment	Assessment (of skills)
2.2	Practical assignment	Assessment (of skills)
2.3	Report	Assessment (of report)
3.1	Practical assignment	Assessment (of skills)
3.2	Practical assignment	Assessment (of skills)
3.3	Practical assignment	Assessment (of skills)
3.4	Practical assignment	Assessment (of skills)
3.5	Report	Assessment (of report)
4.1	Practical assignment	Assessment (of skills)
4.2	Practical assignment	Assessment (of skills)
4.3	Practical assignment	Assessment (of skills)
4.4	Practical assignment	Assessment (of skills)
5.1	Exam	Certification
5.2	Exam	Certification
5.3	Practical assignment	Assessment (of skills)
5.4	Practical assignment	Assessment (of skills)
6.1	Practical assignment	Assessment (of skills)
6.2	Practical assignment	Assessment (of skills)
6.3	Practical assignment	Assessment (of skills)
7.1	Exam	Certification
7.2	Practical assignment	Assessment (of skills)
7.3	Report	Assessment (of report)
8.1	Exam	Certification
8.2	360° assessment	360° assessment
8.3	Practical assignment	Assessment (of skills)
8.4	Practical assignment	Assessment (of skills)
8.5	Practical assignment	Assessment (of skills)
8.6	Exam	Certification
9.1	360° assessment	360° assessment
9.2	360° assessment	360° assessment
9.3	Exam	Certification
9.4	Practical assignment	Assessment (of skills)
9.5	Practical assignment	Assessment (of skills)
9.6	Self-reflection report	Assessment (of report)
10.1	Exam	Certification
10.2	Exam	Certification
10.3	360° assessment	360° assessment
10.4	Report	Assessment (of report)