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CODESMA

Learning units' specifications

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1. INTRODUCTION

1.1. Purpose of this report

The purpose of this report is to provide the specifications of the three learning units defined by the CODESMA consortium, as a set of learning outcomes which can be assessed and which can be accumulated towards a qualification or transferred to other learning programmes or qualifications. The elaborated learning units will be used by the CODESMA partners to further develop the training course. They can also be useful to any VET provider interested in developing customised training materials that may correspond with the CODESMA learning outcomes.

1.2. The need for learning unit specifications

As learning units are the basic building blocks of a curriculum, their specifications define the essential requirements to be met by the corresponding training programme and materials. Therefore, the CODESMA learning unit specifications will be used by the CODESMA partners to further develop the training course, but can also be useful to any VET provider interested in developing customised training materials that may correspond with the CODESMA learning outcomes.

2. METHODOLOGY

Defining the specifications of the learning units was based on ECVET principles, which denote that each unit may include the following elements:

- EQF level of qualification
- Duration of learning process
- Assessment methods
- Weighting of learning units
- Credits allocation
- Prerequisites to attend each learning unit

2.1. Definition of EQF level

Based on the European Qualification Framework descriptors of levels (see <https://ec.europa.eu/ploteus/content/descriptors-page>), and based on the skills, competence and knowledge to be obtained by learners of CODESMA units, the project partners consulted and concluded that the learning units and the qualification should be aligned with the two highest levels of a VET qualification, that is Level 4 and Level 5. More specifically, Level 4 and Level 5 EQF descriptors for skills, competence and knowledge define the following:

EQF Level	Knowledge	Skills	Competence
Level 4	Factual and theoretical knowledge in broad contexts within a field of work or study	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities
Level 5	Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	Exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others

Table 1. EQF Level 4&5



2.2. Duration of the course and learning units

Based on ECVET principles, duration of a course is counted by accumulating the following:

- contact hours (Theory): the amount of expected timetabled hours of teacher-student contact, including lectures, tutorials, seminars and workshops for delivering the theoretical part.
- self-study hours (Individual work): the study of something by oneself without direct supervision or attendance in a class.
- hands-on hours (Practice): practical sessions which can also be supervised.
- assessment hours: the time needed to prepare an assignment, including the time allocated to the exam (if any).

The duration of each learning is 25 hours, leading to the total duration of CODESMA course of 75 hours. The duration of each learning unit should not be considered as strictly defined but as a recommended indicator for each learning unit, so that integration with existing VET courses can be flexible.

The CODESMA VOOC that will be structured on the basis of the developed units, will comprise materials of 35-50 hours (time required for an average learner to access all materials) and will last approximately 3-4 weeks.

2.3. Weighting and suggested allocation of credits

Credit points or ECVET points are a numerical representation of the overall weight of learning outcomes in a qualification and of the relative weight of units in relation to the qualification. Thus, ECVET points do not represent the objective value or complexity of a profession but an agreed framework of skills evaluation between partners, aiming to facilitate the accumulation and transfer of learning outcomes from one qualifications system to another. It is not intended to replace national qualification systems, but to achieve better comparability and compatibility among them. This convention makes it easier for European Union (EU) citizens to gain recognition of their training, skills and knowledge in other EU countries than their own.

Criteria followed for weighting and points allocation are:

- the relative importance of learning outcomes which constitute each unit;
- the complexity, scope and volume of learning outcomes in the unit;

- the effort necessary for a learner to acquire the knowledge, skills and competence required for the unit;
- similar existing courses among participating countries found during desk research for the first Intellectual Output of CODESMA, and
- the overall and each learning unit's duration.

To enable a common approach for the application of ECVET credits, a convention is used according to which 60 credit points are allocated to the learning outcomes expected to be achieved in a year of formal full time VET. Consequently, one ECVET credit point equates to the learning outcomes achieved through 20-25 learning hours. Thus, total recommended time for the CODESMA course is 75 learning hours, corresponding to 3 ECTS credits.

2.4. Definition of assessment methods

According to ECVET principles, assessment comprises methods and processes used to establish the extent to which a learner has attained particular knowledge, skills and competence of learning units. In this context, tasks that validate the understanding of the learning outcomes by learners have to be developed, giving a clear indication of their coverage and depth.

Common assessment procedures consist of written, oral and practical methods such as case-studies, exams (open and closed book), open-ended and closed-ended tests, projects, practical tasks, self-assessment, simulations, group projects, essays, interviews, presentations, portfolios, assignments, skill demonstration, etc.

CODESMA partners, based on their training experience and desk research regarding assessment of similar existing courses in Europe, went through available assessment methods, evaluated and ranked them in order to identify which ones best fit the structure of CODESMA units, and suggested an assessment methodology of 3 (three) assignments (one for each unit), consisting of one case-study with 10 open-ended/ and/or multiple choice questions.



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2.5. Definition of prerequisites

Prerequisites are any prior knowledge, skills or understanding that the learner is required to have before attending a learning unit, including units within the same course and any optional routes.

Based on the content of the learning units, the basic prerequisite for a learner to meet before undertaking any of the CODESMA units is set as the following:

- Holds a VET certificate, equal to or greater than EQF level 4.

3. LEARNING UNITS' SPECIFICATIONS



3.1. Course description

Title	Construction and demolition waste management training for site managers
Description	<p>Site managers, after attending this course will be equipped with all needed skills, knowledge and competence in order to meet current and emerging workplace demands with regards to C&D waste management works and processes.</p> <p>During the course, learners will learn:</p> <ul style="list-style-type: none"> • Basic facts and principles of waste identification, separation and collectio at source • Elimination of hazardous waste • Implementation of proper deconstruction and demolition practices • Preparation and excution of waste management plans for site-works • Provision of guidance on the separation of materials • Consultation with customers, architects, workers and other involved agents • Health and Safety procedures with regard to C&D waste management process
EQF level	4-5
Duration in Hours (class-based course)	75
Duration in Hours (self-study course)	54
ECVET credits	3
General prerequisites	<p>One of the following:</p> <ul style="list-style-type: none"> • VET Certificate, equal to or greater than EQF level 4

3.2. Learning Unit A



Learning Unit A		Construction and Demolition Materials	
EQF level	4-5		
ECVET Credit Value	1		
Duration (class-based course)	Theory	12	
	Practice	6	
	Individual work	6	
	Assessment	1	
	TOTAL	25	
Duration (self-study course)	TOTAL	18	
Prerequisites	General		
Description			
<p>This learning unit introduces the learner to different sources and types of hazardous materials and provides basic facts and principles for on-site waste management: types of waste, logistics and site operations, hazardous waste identification, separation, storage and disposal.</p> <p>Overall Learning Outcome: Learners should understand the fundamental principles, requirements and environmental impacts of waste classification and management and demonstrate how to apply on-site based framework for waste.</p>			
Learning outcomes corresponding to EQF Level 4			
Learning Outcome 1	Ability to distinguish between hazardous and non-hazardous materials and arrange on site material management		
Knowledge	Skills	Competence	
<p>Knows/Aware of: 1.1 Recognise the difference between hazardous and non-hazardous materials. 1.2 Identify good practices of effective use of materials on site.</p>	<p>Able to: 1.3 Effectively utilise space, logistics and site operations. 1.4 Identify hazards and minimise risks to health and safety, arising from the movement, sorting and storage of wastes on site.</p>	<p>Able to: 1.5 Carry out monitoring against planned activities. 1.6 Use and maintain properly personal protective equipment (PPE) required for dealing with different types of hazardous waste.</p>	
Learning outcomes corresponding to EQF Level 5			
Learning Outcome 2	Have knowledge of types of hazardous waste and ability to manage hazardous waste on site		
Knowledge	Skills	Competence	



<p>Knows/Aware of: 2.1 Various types of hazardous waste and its appropriate handling, storage and disposal.</p>	<p>Able to: 2.2 Separate hazardous waste from non-hazardous waste. 2.3 Identify types of hazardous waste.</p>	<p>Able to: 2.4 Instruct others and coordinate management of the hazardous waste. 2.5 Designate appropriate resources to effectively manage identified hazardous waste.</p>
<p>Learning Outcome 3 Capability to identify and classify materials and waste and apply on- site based framework for waste</p>		
<p>Knowledge</p>	<p>Skills</p>	<p>Competence</p>
<p>Knows/Aware of: 3.1 Identification and classification of materials. 3.2 Identification and classification of waste. 3.3 Knowledge of waste hierarchy. 3.4 Working knowledge of the general law related to waste.</p>	<p>Able to: 3.5 Distinguish clearly when material becomes waste. 3.6 Apply waste hierarchy. 3.7 Describe appropriately the Control of Substances Hazardous to Health assessment data for all hazardous substances received, handled and used on site.</p>	<p>Able to: 3.8 Monitor compliance with on site-based framework for waste and being aware of the implementation. 3.9 Check that health and safety instructions are followed.</p>
<p>Learning methods</p>		
<p>Lessons, presentations, discussions, projects, hands-on activities, skill demonstrations, site/company visits.</p>		
<p>Assessment</p>		
<p>10 open-ended questions and/or multiple choice questions, case study (for Level 5).</p>		

3.3. Learning Unit B



Learning Unit B	C&D waste management processes	
EQF level	4-5	
ECVET Credit Value	1	
Duration (class-based course)	Theory	12
	Practice	6
	Individual work	6
	Assessment	1
	TOTAL	25
Duration (self-study course)	TOTAL	18
Prerequisites	General + Learning Unit A	
Description		
<p>This unit covers what a site/project manager is expected to know about development, implementation and review of a Site Waste Management Plan.</p> <p>Overall Learning Outcome: Learners should understand the role and responsibilities of a site/project manager in overseeing the processes related to development and implementation of a Site Waste Management Plan and its communication for the on-site team.</p>		
Learning outcomes corresponding to EQF Level 4		
Learning Outcome 1	Knowledge of responsibilities within and implementation of a Site Waste Management Plan	
Knowledge	Skills	Competence
<p>Knows/Aware of:</p> <p>1.1 The content of the SWMP. 1.2 Responsibilities within SWMP. 1.3 One's own responsibilities in handling construction and demolition waste as a construction company employee.</p>	<p>Able to:</p> <p>1.4 Properly sort waste generated on site, depending on its type. 1.5 Assign tasks and activities to appropriate personnel. 1.6 Compare performance against the SWMP.</p>	<p>Able to:</p> <p>1.7 Practically apply the acquired theoretical knowledge about C&D waste management, work safety, environmental compliance. 1.8 Communicate effectively with the on-site team.</p>
Learning outcomes corresponding to EQF Level 5		
Learning Outcome 2	Development of Site Waste Management Plan for a specific site and monitoring its implementation	
Knowledge	Skills	Competence



<p><u>Knows/Aware of:</u> 2.1 Principles of preparation of SWMP.</p>	<p><u>Able to:</u> 2.2 Find the most up-to-date information (various legal acts and other sources of information) about C&D waste management and adapt the innovations to a specific site. 2.3. Draft SWMP for a particular site.</p>	<p><u>Able to:</u> 2.4 Assume responsibility for development and monitoring of the SWMP. 2.5 Disseminate and explain the SWMP to relevant stakeholders.</p>
<p>Learning Outcome 3</p>		<p>Ability to carry out after action review of Site Waste Management Plan and recommend improvements</p>
<p>Knowledge</p>	<p>Skills</p>	<p>Competence</p>
<p><u>Knows/Aware of:</u> 3.1 Knowledge of measuring performance of SWMP. 3.2 Knowledge of Plan-Do-Check -Act management model.</p>	<p><u>Able to:</u> 3.3 Interpret the results of the SWMP performance. 3.4 Recognise good practices in site waste management.</p>	<p><u>Able to:</u> 3.5 Disseminate good practices and lessons learned as appropriate to on site operational team.</p>
<p>Learning methods</p>		
<p>Lessons, presentations, discussions, projects, hands-on activities, skill demonstrations, site/company visits.</p>		
<p>Assessment</p>		
<p>10 open-ended questions and/or multiple choice questions, case study (for Level 5).</p>		



3.4. Learning Unit C

Learning Unit C	Waste management technologies	
EQF level	4-5	
ECVET Credit Value	1	
Duration (class-based course)	Theory	12
	Practice	8
	Individual work	4
	Assessment	1
	TOTAL	25
Duration (self-study course)	TOTAL	18
Prerequisites	General + Learning Unit A + Learning Unit B	
Description		
<p>This unit covers technical and organizational aspects to recognise and utilise appropriate technologies for dealing with waste.</p> <p>Overall Learning Outcome: Learners should understand the technical issues related to waste management, including good practices from non-construction sector, and demonstrate how to apply them in construction and demolition industries.</p>		
Learning outcomes corresponding to EQF Level 4		
Learning Outcome 1	Having knowledge of waste management technologies and the utilisation of appropriate technologies on site	
Knowledge	Skills	Competence
<p>Knows/Aware of:</p> <p>1.1 Existing technologies for dealing with waste. 1.2 Technologies and best practices for re-use or recycling of C&D waste.</p>	<p>Able to:</p> <p>1.3 Recognise and utilise appropriate technologies to deliver SWMP.</p>	<p>Able to:</p> <p>1.4 Monitor use and performance of technologies as identified in SWMP.</p>
Learning outcomes corresponding to EQF Level 5		
Learning Outcome 2	Knowledge of existing technologies for waste within the sector and their optimisation on-site	
Knowledge	Skills	Competence
<p>Knows/Aware of:</p> <p>2.1 Evaluating the opportunities of existing sector technologies for waste.</p>	<p>Able to:</p> <p>2.3 Identify opportunities for implementation of existing technologies.</p>	<p>Able to:</p> <p>2.5 Select good practices to use on-site.</p>



2.2 Measurement criteria for evaluation of technologies for waste.	2.4 Match needs of an individual site to best available technologies.	
Learning Outcome 3	Investigation of existing technologies dealing with similar waste streams from non-construction sector to apply on site if feasible	
Knowledge	Skills	Competence
<p>Knows/Aware of:</p> <p>3.1 Introduction to relevant software and IT as it relates to waste management.</p> <p>3.2 Knowledge of technologies of the circular economy model in non-construction sector for similar waste streams, e.g. packaging plastics.</p>	<p>Able to:</p> <p>3.3 Identify potential opportunities for using good practices from non-construction sector.</p> <p>3.4 Communicate the benefits to site of use of non-construction sector technologies.</p>	<p>Able to:</p> <p>3.5 Investigate practices in non-construction sector and potential of applying them in construction.</p> <p>3.6 Raising awareness of alternative technologies from non-construction sector with the site management.</p>
Learning methods		
Lessons, presentations, discussions, projects, analysis of best practice, hands-on activities, site/company visits.		
Assessment		
10 open-ended questions and/or multiple choice questions, case study (for Level 5).		