
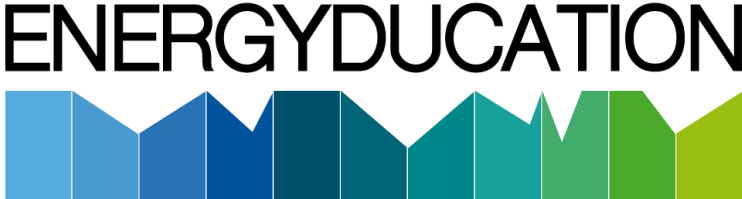


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Energyducation SQF Level:	4					
ECVET Points:	(if applicable)					
ECTS Credits:	(if applicable)					
EQF (NQF) Level	ES	NL	SE	NO	DE	CH
	5	4	5	4	4	5
<b>Aggregated Units of Learning Outcomes</b>	Energyducation – U1		<a href="#">Introduction to Smart Energy Management</a>			
	Energyducation – U2		<a href="#">Design and Analysis of Smart Energy Measurement Systems</a>			
	Energyducation – U3		<a href="#">Implementation of Smart Energy Management Systems</a>			
	Energyducation – U4		<a href="#">Smart Lighting</a>			
	Energyducation – U5		<a href="#">UX design</a>			
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## Learning Outcomes

<b>U1 Introduction to Smart Energy Management</b>	Training Module Code	Competence	
		Knowledge	Skills
1.1: Climate change and the need to save energy	1/1 1/3	Is able to understand the importance of saving energy	
		Knows the phenomena of climate change and the need of CO2 reduction	Brings together climate change with the own living basics
			Identifies CO2 sources and has an understanding of how to reduce the CO2 emissions
		Understands the climate activities of the European Commission as an important contribution to save the living basics of the people in Europe an all over the world	
1.2: Basics of Smart Energy Management (SEM)	1/1 1/2 1/3	Is able to apply the concept of Smart Energy Management (SEM)	
		Knows how and where energy can be saved by SEM	Understands that energy can be saved during energy transformation, transport, storage and consumption
			Understands that human behaviour is an important part of the strategies for SEM
		Knows the basic elements of how to implement a SEM system	Understands that information exchange between sensors, actors, controllers, user interfaces and human behaviour is necessary
			Understands that sensors, actors, controllers, user interfaces and human behaviour can be brought together with strategies to save energy
			Understands the need for technical and human standards for the implementation of SEM
Knows the definition of SEM and related technical approaches		Can apply the principles of SEM in installation planning	

			Identifies smart home, smart metering and smart grid as profession fields for SEM
1.3: Smart Energy Management experts	1/2 1/3	Is able to understand what a SEM expert is and how s/he can qualify to one	
		Knows working fields of SEM	Brings together her/his profession with SEM
		Understands the mutual dependence of SEM experts in different fields	
	Knows the fundamental workflow to create a SEM system	Understands the need of standards for SEM regarding complex working processes	
		Identifies standards for SEM	
Retraces a SEM workflow			

Learning Outcomes			
U2 Design and Analysis of Smart Energy Measurement Systems	Training Module Code	Competence	
		Knowledge	Skills
2.1: Identification of measurement points and parameters	4/3/2	Is able to define energy measurement parameters in the system	
	4/3/3	Knows how to calculate thermal energy (air/water) and energy balance (generation, distribution, consumption)	Interprets a certain energy system scheme identifying where to measure energy
			Defines where to measure energy in each of the phases (generation, distribution, emission).
			Quantifies energy balance in the system (generation, distribution, consumption) and related efficiency rate

		Knows how to calculate the electrical energy profile (mono/three phase) and its parameters (active energy, cos phi, ..)	Interprets a certain electrical scheme identifying where to measure energy
			Defines where to measure energy in each of the steps (generation, transference, consumption)
			Quantifies energy balance in the system (generation, distribution, consumption) and related efficiency rate
2.2: Implementation of energy measurement sensors and grid analysers (thermal/electric)	4/3/2	Is able to identify and mount the most suitable sensors for measurement of parameters	
	4/3/3	Describes fundamentals of temperature, flow rate sensors (thermal energy)	Identifies and mounts the most suitable temperature sensor for a certain situation
		Describes fundamentals of grid analysers	Identifies and mounts the most suitable flow rate sensor for a certain situation
			Identifies and mounts the most suitable grid analyser for a certain situation
2.3: Implementation of monitoring platforms	4/3/2	Is able to identify which platform to use for integration of monitored data	
	4/3/3	Describes fundamentals of open hardware/software monitoring platforms	Identifies suitable data acquisition cards
			Uses computer programming to create energy calculation parameters
		Describes fundamentals of proprietary monitoring	Identifies the most suitable proprietary platform for a given monitoring project

		platforms	Implements a certain visualization platform from a proprietary system
2.4: Analysis of energy balance and efficiency rates	4/5	Is able to identify energy balance and efficiency rates	
	4/6	Understands the fundamentals of energy transfer efficiency calculation	Carries out a yearly balance of energy identifying energy surplus and shortage periods
	4/7		Assesses the efficiency rate in energy terms for a certain equipment (whether it is generator, transfer or final consumption unit)
2.5: Analysis of consumer behaviour related energy consumption patterns	4/7	Is able to identify consumer behaviour related patterns and its accordance with estimated use	
		Understands the fundamentals of electric profile interpretation (peak loads, permanent consumption, reactive energy)	Identifies “unexpected events” in readings and their cause

### Learning Outcomes

U3 Implementation of Smart Energy Management Systems	Training Module Code	Competence	
		Knowledge	Skills
3.1: Overview of the energy sources and their distribution in Europe	5.1	Is able to describe the advantages and disadvantage of different energy sources	
		Has knowledge about different energy sources in Europe and why they differ between countries	Identifies certain conditions and emissions of different energy sources

			Identifies an energy source
			Analyses a country's energy demand
		Understand the distribution of energy in Europe	Explains the different levels of energy distribution
			Explains the necessary products in a distribution system
			Presents future energy systems
3.2: The use of energy in buildings	5.2	Is able to analyse energy use in buildings and industries	
		Knows about the common energy users in a buildings and industries	Categorize energy users in a building Categorize energy users in industries
3.3: Energy management iso 50001	5.2	Is able to initiate and perform lightweight energy management	
		Knows what energy management is and how it can be performed	Exemplifies energy management and make actions.
3.4: Energy audit	5.3	Is able to understand the concept of energy audits and analyse the results	
		Knowledge about energy audits and their purpose	To state the necessary steps of an energy audit
		Knows how to obtain necessary data about the energy use	To compile and categorize necessary data
		Knows what to measure	To perform easier measurements
3:5 Analysis of energy users	5.3	Is able to analyse the energy use of a building	

		Has knowledge about base load	Performs and analyses the baseload of a building
		Has knowledge about peak load	Performs and analyses the peak load of a building
3:6 Actions of energy efficiency	5.3	Is able to find and count on energy efficiency actions	
		Has knowledge about actions of energy efficiency	Exemplifies energy efficiency actions
		Knows about the concepts LCC and payback time	Calculates cost investments.

U4 Smart Lighting	Training Module Code	Competence	
		Knowledge	Skills
4.1: Lighting	6/1	Is able to achieve energy reduction by using different types of	
	6/2 6/3	Knows the different types of light (conventional, high frequency, LED) and their properties	Differentiates between different types of light
			Identifies the necessary properties
			Applies the standards for lighting
		Knows how to calculate lighting plans	Applies the standards for lighting
			Designs a lighting plan
Installs different kind of light fixtures			
4.2: Smart lighting	6/4	Is able to provide customers with a smart lighting solution	

	6/5	Knows different smart lighting devices	Installs smart lighting devices
			Uses smart lighting devices to gather data
		Knows different smart lighting control systems	Installs lighting control systems
			Uses lighting control systems to read the data
	Knows how to advise about lighting solutions		Provides customers with a lighting solution
4.3: Designing lighting systems	6/5	Is able to design a smart lighting system to reduce energy consumption	
		Knows about energy management based on lighting systems	Uses the sensors in the smart lighting system to gather data about energy management
			Analyses the data gathered by the smart lighting system
			Uses actuators to influence energy usage
		Knows about lighting solutions for different types of buildings	Designs different lighting solutions for different types of users
			Designs different lighting solutions for different types of buildings
		Knows about different properties of light	Influences the activities of the user with different types of light



Learning Outcomes			
U5 UX design	Training Module Code	Competence	
		Knowledge	Skills
5.1: UX design basics	7/2	Is able to create a user interface on paper	
	7/3	Knows the goal and character of user interfaces and navigation patterns	Thinks from a user perspective
	7/4		Applies the knowledge of user interfaces and navigation patterns
	7/5	Knows about user flow charts	Creates user flows
			Creates prototypes on paper
5.2: Using digital design systems for installation planning	7/6	Is able to identify the most suitable way to create a digital prototype of the user interface	
	7/7	Know about Artboards, Artwork, Groups, Symbols, Lock	Decides on which program to use
			Identifies the most suitable symbols and artwork
			Defines logical groups
			Creates prototypes digitally
5.3: Testing and finalizing the User Interface	7/6	Is able to create a digital UI prototype of a Smart Energy Management system	
	7/7	Knows about lo-fi and Hi-fi testing	Decides on the test method
			Uses the test method
			Analyses the test and adjusts the UI

		Knows about prototype mode, animations, images/colours/icons	User-tests every prototype
			Analyses the prototype tests
			Decides on aspects
		Knows about design consistencies	Uses an iterative design process
			Delivers the final user interface