SustainEU

WP2 – EU Sustainability Competence Profile and Curriculum

Elaborated by: Paderborn University

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WP2 – EU Sustainability Competence Profile and Curriculum

1. Introduction

The objective of Work Package 2 is to develop a new Vocational Education and Training (VET) curriculum for the ESE (European Sustainability Expert) qualification, addressing the green skills gap (the disparity between the supply and demand of skilled workers in the green labour market) in Europe. The creation of a standardised Professional Profile based on the ESCO classification for a sustainability manager, aligned with the European Credit System for Vocational Education and Training (ECVET), achieves consistency and comparability across qualification frameworks in the partner countries. With the help of a common framework, roles, responsibilities, and expected competencies are defined, and labour market mobility is facilitated within Europe.

The ESE curriculum sets clear goals and requirements, providing transparency for trainers and learners. It sets the training course aim, objectives, pre-requirements for enrolling in the course, and is in line with ECVET points.

In the following section, the ESE Professional Profile is presented with knowledge, skills, and transversal skills based on the ESCO classification for a sustainability manager. This profile outline is the basis for the competence matrix of the curriculum. After a guideline on how to design learning outcomes of a course, the competence matrix is presented. The ESE competence matrix comprises 9 competence units, which cover the course modules. At the end, there is an overview of the training methodology, followed by an overview of the summative assessment of the curriculum.

2. European Sustainability Expert Professional Profile

The European Sustainability Expert (ESE) professional profile is aligned to the ESCO (European Skills, Competences, Qualifications and Occupations) classification for a sustainability manager (Code: 1213.8 on https://esco.ec.europa.eu/en/classification/occupation_main; ESCO dataset – v1.2.0). According to ESCO, a sustainability manager is described as follows: “Sustainability managers are responsible for ensuring the sustainability of business processes. They provide assistance in the design and implementation of plans and measures to ensure that the manufacturing processes and products comply with given environmental regulations and social responsibility standards, and they monitor and report on the

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implementation of sustainability strategies within the company's supply chain and business process. They analyse issues linked to manufacturing processes, use of materials, waste reduction, energy efficiency and product traceability to improve environmental and social impacts and integrate sustainability aspects into the company culture." In other words, the role of the sustainability manager is to ensure that companies operate in an environmentally friendly and socially responsible manner. They facilitate the planning and implementation of measures to ensure that production processes and products comply with environmental regulations and social standards. Furthermore, they are tasked with the monitoring and evaluation of the implementation of sustainability strategies. They analyse how materials are used, how waste can be reduced, energy saved, and how the traceability of products can be improved. The overarching objective of sustainability managers is to firmly integrate sustainability into the corporate culture.

With this in mind, the following skills, competences and knowledge necessary for the European Sustainability Expert are presented in the following section, as they result from the ESCO classification.

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2.1 Essential Knowledge

Essential Knowledge	Description (ESCO)	Alternative Labels	Learning Outcome Type
Alternative energy	Sources of energy that do not originate from fossil fuels and have few greenhouse emissions.	- alternative energy sources	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8f585def-6ade-41b3-b897-3d71fba4151d			
Circular economy	The circular economy aims to keep materials and products in use for as long as possible, extracting the maximum value from them while in use and recycling them at the end of their life cycle. It improves resource efficiency and helps to reduce the demand for virgin materials.	- resource-efficient economy	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/22c45bf7-e52b-475f-847b-c32a87f65a5d			
Climate change impact	The impact of climate change on biodiversity and life conditions for plants and animals.	- impact of global warming - results of climate change impact - results of global warming impact - scope of climate change impact	knowledge

		- scope of global warming impact	
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1565b401-1754-4b07-8f1a-eb5869e64d95			
Corporate social responsibility	The handling or managing of business processes in a responsible and ethical manner considering the economic responsibility towards shareholders as equally important as the responsibility towards environmental and social stakeholders.	- Corporate Social Responsibility (CSR) - responsible business - social performance	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/66db424f-2abe-420d-8e5b-186607266b61			
Corporate sustainability	A business practice to conduct long-term sustainable growth by seeking environmental, economic, and social strategies as its three main pillars.	- corporate sustainability strategies	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5bf985b-ac78-4d23-881a-18a359234528			
Emission standards	The legal limitations of the number of pollutants that can be emitted into the environment. The EU legislative framework regulating emission standards for driving vehicles.	- air pollution controls - air pollution vehicle regulations - emission regulations - legal requirements for emissions	knowledge

ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bdc2f65-b42f-4963-abff-d7214ca4caae			
Energy conservation	The practice of reducing energy consumption and using fewer energy services. As a sustainable process, energy conservation is done by replacing used energy with alternative sources, using more efficient energy products, or refraining from particular energy products or services to conserve it.	- energy optimisation	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ddce2912-bc0f-4a47-aa2b-c1de48bc4b44			
Energy efficiency	Field of information concerning the reduction of the use of energy. It encompasses calculating the consumption of energy, providing certificates and support measures, saving energy by reducing the demand, encouraging efficient use of fossil fuels, and promoting the use of renewable energy.	- efficient energy use - energy conservation - energy saving - promote energy efficiency - reduce use of energy	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/83fc0b2b-6cd2-46af-b1ff-d3fc83604c26			
Environmental legislation	The environmental policies and legislation applicable in a certain domain.	- environmental regulations	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f5850ea-5785-4e2c-b062-743066fd5bdb			

Environmental management standards	The requirements for an organisation to implement the environmental management system to enhance its environmental performance such as ISO 14001.	- EMS - ISO 14000 - ISO 14001	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/95bff246-c3ce-4181-a11b-e4363453c2f8			
Environmental policy	Local, national and international policies dealing with the promotion of environmental sustainability and the development of projects which reduce negative environmental impact and improve the state of the environment.	- environmental sustainability policy - international environmental policy - local environmental policy - national environmental policy	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/081d7679-5070-4777-bece-a28c49f15636			
Global standards for sustainability reporting	The global, standardised reporting framework that enable organisations to quantify and communicate about their environmental, social and governance impact.	- global reporting framework for sustainability - global reporting guidelines for sustainability - non financial reporting guidelines	knowledge

		- sustainability standardised reporting frameworks	
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4300b453-9bcf-474c-9ee3-92ec2229720c			
Green computing	The use of ICT systems in an environmentally responsible and sustainable manner, such as the implementation of energy-efficient servers and central processing units (CPUs), reduction of resources and correct disposal of e-waste.	- sustainable computing	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e78d9c9-7c3c-4c5c-82cb-205c16edbcb8			
Resource-efficient technologies	Sustainable technologies which allow to produce more value using limited resources while reducing the impact on the environment, restraining the risks of scarcity.	- resource efficiency	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d1f73ae9-d348-4aac-b5d5-9b6d508401d3			
Risk management	The process of identifying, assessing, and prioritising of all types of risks and where they could come from, such as natural causes, legal changes, or uncertainty in any given context, and the methods for dealing with risks effectively.	- risk assessment	knowledge

ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6eff134b-e34f-4d6e-a6e8-5e47cf2228d0			
Sustainability consulting	The consulting approach used to help businesses to know more about their sustainability impact and implement strategies to become eco-friendly and efficient.	- sustainability consulting services	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d84326c9-a3d3-4e22-a6a1-1ad42a356f10			
Sustainable finance	The process of integrating environmental, social and governance (ESG) considerations when making business or investment decisions, leading to increased longer-term investments into sustainable economic activities and projects.	- knowledge of sustainable finance - responsible investment - sustainable investment	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/203083ca-b051-4c28-8986-fc8731bacee5			
Sustainable technologies	Technologies with the aim of reducing environmental and ecological risks, achieving at the same time, a positive economic, social, and environmental impact. They are innovative technologies designed to prevent, reduce and recover from the negative impact of humanity on the planet.	- alternative energy - clean energy - green technologies	knowledge

ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/103f7814-d262-4df6-a1b6-759bc51f76cb			
Waste management	The methods, materials and regulations used to collect, transport, treat and dispose of waste. This includes recycling and monitoring of waste disposal. It excludes procedures related to waste incineration.	Waste regulation	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/40f65a56-ccbe-4601-9f32-1cc6cdd24f28			

2.2 Essential Skills and Competences

Essential Skills and Competences	Description (ESCO)	Alternative Labels	Learning Outcome Type
Advise on carbon emissions reduction	Give companies advice on reducing industry carbon emissions, identify incentives, and keep them up to date with carbon emissions regulations and policies, as well as with innovative reduction methods.	- advise on carbon footprint reduction - counsel on carbon emissions reduction	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c8b4b02c-d9ce-4e24-ab43-5dd52c6dff48			
Advise on corporate social responsibility	Inform others about the social responsibility of companies and organisations in society and advise about matters to prolong their sustainability.	- advise on matters of social responsibility and sustainability - give recommendations on social responsibility and sustainability matters - offer suggestions on social responsibility and sustainability matters	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b2f05068-c409-43ec-ba58-b5dfe991ca5e			

Advise on sustainability solutions	Advise companies on solutions to develop sustainable production processes, improve material efficiency and reuse and reduce carbon footprint.	- advise on environmentally friendly solutions	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dbef5042-4b99-4e6f-b2ed-1d33b07b3ed6			
Advise on sustainable management policies	Contribute to planning and policy development for sustainable management, including input in environmental impact assessments.	- advocate sustainable management - encourage sustainable management - promote sustainable management	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6742977a-aa00-4c8c-9861-898b0373907e			
Analyse business requirements	Study clients' needs and expectations for a product or service to identify and resolve inconsistencies and possible disagreements of involved stakeholders.	- analyse customer product risks	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17			
Analyse supply chain strategies	Examine an organisation's planning details of production, their expected output units, quality, quantity, cost, time available and labour requirements.	- improve supply chain strategies - analyse procurement strategies - analyse supplies' logistics	skill

	Provide suggestions to improve products, service quality and reduce costs.	- examine supply chain strategies	
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/96d549bb-3e62-4c45-92a7-f114df089581			
Assess environmental impact	Monitor environmental impacts and carry out assessments to identify and reduce the organisation's environmental risks while taking costs into account.	- assess environmental risks	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e541c69c-ea80-4b17-87cb-4001d0b9d303			
Assess the life cycle of resources	Evaluate the use and possible recycling of raw materials in the whole product life cycle. Consider applicable regulations, such as the European Commission's Circular Economy Policy Package.	- study the life cycle of resources - evaluate the life cycle of resources	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4e87c852-602a-4a0e-b8d8-20709ce14ac5			
Carry out training in environmental matters	Perform staff training and ensure all members of the workforce understand how they can contribute to improved environmental performance.	- complete training in environmental matters	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2cb27e30-2be7-4a09-9502-fdd2102c046b			

Coordinate environmental efforts	Organise and integrate all environmental efforts of the company, including pollution control, recycling, waste management, environmental health, conservation and renewable energy.	- promote environmental efforts - regulate environmental efforts	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd70f004-e1d6-43f0-96f1-59c014a4ea01			
Ensure compliance with environmental legislation	Monitor activities and perform tasks ensuring compliance with standards involving environmental protection and sustainability,amend activities in the case of changes in environmental legislation. Ensure that the processes are compliant with environmental regulations and best practices.	- check compliance with environmental laws - ensure compliance with environmental regulations - lead implementation of environmental policies and legislation	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/089ee650-297e-4716-87d1-440743b70a0d			
Environmental design	The approach used to face environmental problems related to buildings, plans, and products in various fields such as engineering, interior design and architecture.	- environmental design process	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dab7c301-2a33-454e-8fed-23218fa28eee			

Lead the sustainability report process	Oversee the process of reporting on the sustainability performance of the organisation, according to established guidelines and standards.	- oversee sustainability reporting in organisations - oversee the sustainability reporting process	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bbcc7e1b-3d4d-4422-9fac-efd636eb9de4			
Manage environmental management system	Develop and implement an environmental management system.	- oversee environmental management systems - regulate environmental management systems - supervise environmental management systems	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b13e0689-636d-42d0-86c3-df9d6f85a882			
Manage recycling program budget	Manage the annual recycling program and respective budget of an organisation.	- oversee recycling program budget - regulate recycling program budget - supervise recycling program budget	skill

ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9d3eb78-a7c6-4076-9e19-df225af2ec62			
Measure company's sustainability performance	Keep track of sustainability indicators and analyse how well the company is doing in sustainability performance, in relation to the Sustainable Development Goals or the global standards for sustainability reporting.	- assess sustainability performance	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d53eab76-e8ff-4e28-af26-7e012951c763			
Mitigate waste of resources	Evaluate and identify opportunities to use resources more efficiently with continuously striving to reduce waste of utilities.	- effective use of waste resources - stop the waste of resources - waste resource efficiency	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d2c81ad1-2439-43cf-9c63-204187b8f771			
Promote environmental awareness	Promote sustainability and raise awareness about the environmental impact of human and industrial activity based on the carbon footprints of business processes and other practices.	- encourage environmental awareness	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8abdc43c-2bfd-417c-97c2-27fcdaf53171			

Use sustainable materials and components	Identify, select environmentally friendly materials and components. Decide on the substitution of certain materials by the one that are environmentally friendly, maintaining the same level of functionality and other characteristics of the product.	- apply sustainable components - deploy sustainable materials	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/73576419-31c2-4e45-8e30-ab1afec3db4e			

2.3 Optional Knowledge

Optional Knowledge and Competences	Description (ESCO)	Alternative Labels	Learning Outcome Type
Alternative fuels	Fuels or power sources that serve, at least partly, as a substitute in the traditional energy supply to transport such as oil and fossil sources. They have the potential to contribute to decarbonisation efforts and enhance the environmental performance of the economy and transport sector.	- biofuels - carbon neutral/negative fuel - clean fuel - e-fuels	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e9ff446f-6a8a-4e35-a611-176508964be3			
By-products	Concepts of by-product and waste. Types of waste and European waste codes industries. Solutions for by-products and waste recovery, reuse and recycling across different sectors.	- secondary materials	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f2412a5c-8072-4cd7-8fa1-806864f91276			
Communication principles	The set of commonly shared principles in regards with communication such as active listening, establishing rapport, adjusting the register, and respecting the intervention of others.	- communication ideals - communication principle - communication theories	knowledge

ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe30a4b0-1a99-4fc7-afff-b162b8c834ba			
Energy market	The trends and major driving factors in the energy trading market, energy trades methodologies and practice, and the identification of the major stakeholders in the energy sector.	- energy trading	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/071c7f1d-f659-4b96-a222-b21012297f3b			
Environmental economics	The subfield of economics that studies the efficient allocation of environmental resources to the aim of minimising the negative impacts on the natural environment.	- principles of environmental economics	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1063b061-329e-4212-8db4-ab936dc60efc			
Green bonds	The financial instruments traded in financial markets that aim at raising capitals for projects with specific environmental benefits.	- bonds for environmentally friendly projects - bonds for green projects - bonds for sustainable projects - sustainability bonds	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/86f0bb12-6491-4be7-8306-c88900e91a63			

Project management	The discipline of project management, its activities and variables such as time, resources, requirements, deadlines, and responding to unexpected events.	- principles of project management - project management activities	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7111b95d-0ce3-441a-9d92-4c75d05c4388			
Water reuse	Principles of water re-use processes in complex circulation systems.	- methods for water reuse - principles of water reuse	knowledge
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b970e437-2f8b-42e3-ae49-6718a0cca44f			

2.4 Optional Skills and Competences

Optional Skills and Competences	Description (ESCO)	Alternative Labels	Learning Outcome Type
Advise on environmental risk management systems	Evaluate requirements and advise on systems for environmental risk management. Ensure the customer does his part in preventing or limiting adverse environmental impact using technology. Ensure required licenses and permits are obtained.	- give advice on environmental risk management systems	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a366bfc5-8d17-4792-a9f0-db0951528dda			
Advise on waste management procedures	Advise organisations on the implementation of waste regulations and on improvement strategies for waste management and waste minimisation, to increase environmentally sustainable practices and environmental awareness.	- give advice on waste management procedures	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f82b05a7-128b-4a72-a815-044ff6062f62			
Analyse environmental data	Analyse data that interpret correlations between human activities and environmental effects.	- evaluate environmental data - examine environmental data - inspect environmental data	skill

		- review environmental data - survey environmental data	
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/77f109c4-3107-4d2a-a512-5160ac103933			
Apply procedures and regulations for eco-labelling	Identify, select and apply procedures and regulations to verify the compliance of specific requirements of EU eco-labelling.	- comply with protocols for sustainable labelling - enforce eco-labelling protocols - enforce standards for eco-labelling - identify regulations for EU eco-labelling - implement protocols and rules for eco-labelling	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/670ebf56-761c-4d3d-865a-db14085b77f7			
Apply systematic design thinking	Apply the process of combining systems thinking methodologies with human-centred design to solve complex societal challenges in an innovative and sustainable way. This is most often applied in social innovation practices that focus less on designing stand-alone products and services to designing complex	- apply combined system thinking methodologies - use system design	skill

	service systems, organisations or policies that bring value to society as a whole.		
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4d30ad07-9e39-4899-81dd-02b280f162f9			
Assess supplier risks	Evaluate supplier performance to assess if suppliers follow the agreed contracts, meet the standard requirements and provide the desired quality.	- check supplier risks	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/96ec2d53-4f41-4172-8ef2-70742c4bb540			
Carry out energy management of facilities	Contribute to develop effective strategies for energy management and making sure that these are sustainable for buildings. Review buildings and facilities to identify where improvements can be made in energy efficiency.	- undertake energy audit of facilities	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/885808f7-f42b-406e-95f2-28efcd45ddda			
Conduct energy audit	Analyse and evaluate the energy consumption in a systematic manner to improve energy performance.	- analyse energy consumption	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ad6d5e8-593f-4191-843c-439b23a468ca			

Conduct research on food waste prevention	Research and evaluate methods, equipment and costs for reducing and managing food waste. Monitor recorded measurement data and identify areas for improvement relating to food waste prevention.	- analyse data on food waste prevention and comparative reduction of food costs - conduct research on the costs for managing food waste - evaluate methods for reducing food waste - perform investigation to reduce food waste	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bbfb0e36-807c-492f-bed2-267224ba7bc7			
Design indicators for food waste reduction	Determine key performance indicators (KPI) for reducing food waste and managing in line with established standards. Oversee the evaluation of methods, equipment and costs for food waste prevention.	- design the evaluation of food waste prevention practices and strategies - develop KPI on food waste reduction - manage KPI to reduce food waste	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3936cc7d-d045-4eb0-b951-b862a072c0a2			

Design food waste reduction strategies	Develop policies such as staff meal or food redistribution to reduce, reuse and recycle food waste where possible. This includes reviewing purchasing policies to identify areas for reducing food waste, e.g., quantities and quality of food products.	- develop methods for food redistribution - develop staff meal policies - identify areas for food waste reduction - reduce food waste	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dff0087d-25e4-40bf-979e-32fdf2445438			
Develop recycling programs	Develop and coordinate recycling programs; collect and process recyclable materials to reduce waste.	- establish recycling programs - evaluate recycling programs - launch recycling programs - produce recycling programs	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/862920c8-f2d0-4058-8fb8-9f06fbfc2446			
Implement environmental action plans	Apply plans that address the management of environmental matters in projects, natural site interventions, companies, and others.	- perform activities to realise environmental action plans - put plans that address environmental matters into action	skill

ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/59004ee8-3975-4877-bf82-ff0b8070ef28			
Implement sustainable procurement	Incorporate strategic public policy goals into procurement procedures, such as Green Public Procurement (GPP) and Socially Responsible Public Procurement (SRPP). Contribute to reducing the environmental impact of procurement, to achieving social goals and to improving value for money for the organisation and for society at large.	- implement green public procurement - implement socially responsible public procurement	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6962058d-9808-4820-a6bc-d7cabce60cde			
Monitor manufacturing impact	Check the impact of manufacturing machinery on the environment, analysing temperature levels, water quality and air pollution.	- check environmental parameters - monitor environmental parameters	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3d69b305-4051-4c1d-ba1e-d8c5b35e22db			
Perform project management	Manage and plan various resources, such as human resources, budget, deadline, results, and quality necessary for a specific project, and monitor the project's progress to achieve a specific goal within a set time and budget.	- manage projects	skill

ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68			
Promote sustainable packaging	Apply safe and healthy packaging policies; maximise the use of recycled or renewable source materials; implement clean production technologies.	- encourage sustainable packaging	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51399b1c-15d6-4e4c-8673-30c25a094fce			
Supervise waste water treatments	Supervise waste water treatment according to environmental regulations.	- manage waste water treatment	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fcc29203-1f8d-4c54-90ee-78cb18467695			
Train staff to reduce food waste	Establish new trainings and staff development provisions to support staff knowledge in food waste prevention and food recycling practices. Ensure that staff understands the methodsand tools for food recycling, e.g., separating waste.	- educate workers on food recycling methods - inform staff on food waste reduction practices	skill
ESCO Link: https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/001d46db-035e-4b92-83a3-ed8771e0c123			

2.5 Transversal Competences

Category	Description	European Union (2018)	UNESCO (2016)	Relevance for Sustainability and Waste Management
Cognitive Competences	**Environmental Data Analysis:** Collecting and interpreting environmental data for sustainable decision-making. **Science Communication:** Translating complex scientific data into accessible formats for a broader audience.	**Literacy:** Ability to understand, analyse, and extract knowledge from various sources. **Mathematical & STEM Competence:** Ability to use scientific concepts and quantitative methods. **Digital Competence:** Ability to use digital technologies for information processing and problem-solving.	**Critical & Innovative Thinking:** Ability to solve problems creatively, make reflective decisions, and develop new solutions.	- Using digital technologies to monitor waste data and sustainable resource use. - Engaging in critical discussions on environmental issues through science-based communication.
Interpersonal Competences	**Convincing Communication:** Ability to persuade	**Personal, Social & Learning Competence:** Ability to interact effectively with others, acquire knowledge	**Interpersonal Skills:** Ability to communicate effectively in groups, organise oneself, and	- Promoting community initiatives such as clean-up days.

	stakeholders in sustainability projects. **Interdisciplinary Teamwork:** Collaboration with experts from various disciplines to solve environmental challenges.	independently, and develop oneself. **Citizenship Competence:** Understanding societal processes and actively participating in the community.	collaborate cooperatively.	- Working together on environmental projects, such as developing recycling strategies in schools.
Intrapersonal Competences	**Creative Problem-Solving:** Developing innovative solutions for waste reduction and sustainable resource management.	**Entrepreneurial Competence:** Ability to identify opportunities, develop innovative ideas, and implement them independently.	**Intrapersonal Skills:** Self-discipline, perseverance, enthusiasm, and self-motivation to achieve goals.	- Developing sustainable innovations to reduce waste or improve waste management. - Motivating long-term changes in consumption and disposal behaviour.
Cultural Competences	**Cross-Cultural Communication:** Ability to engage effectively in	**Multilingualism:** Ability to express oneself in multiple languages and communicate interculturally.	**Global Citizenship:** Ability to understand global challenges, take responsibility for sustainable development, and	- Understanding diverse perspectives on environmental issues and waste prevention

	international sustainability projects.	**Cultural Awareness & Expression:** Understanding cultural differences and engaging in creative expression.	advocate for social justice.	across different cultures. - Raising awareness on sustainable practices in different cultural contexts.
Media & Information Competence	**Media & Information Literacy:** Ability to critically evaluate media content, conduct research, and handle digital contentresponsibly	Developing and overseeing environmental action plans that outline sustainability goals, regulatory compliance strategies, and best practices for minimising ecological impact.	No direct classification in the UNESCO framework.	- Critically engaging with fake news and greenwashing in environmental discussions. - Using media to raise awareness of sustainability and recycling.
Management & Implementation	**Project Management:** Planning and executing environmental and sustainability projects. **Implementing Environmental Action Plans:** Developing and executing strategies to	No direct classification in the EU framework.	No direct classification in the UNESCO framework.	- Designing and implementing sustainability programmes in schools and communities. - Leading recycling and waste management initiatives.

	reduce waste and conserve resources.			
		EU 2018: https://op.europa.eu/en/publication-detail/-/publication/297a33c8-a1f3-11e9-9d01-01aa75ed71a1/language-en	UNESCO 2016: https://unesdoc.unesco.org/ark:/48223/pf0000246590	

3. Learning Outcome Guideline

Well-formulated learning outcomes serve as a common thread throughout the entire teaching and learning process. They help to select teaching content and methods in a targeted manner, develop appropriate forms of assessment, systematically evaluate learning success, and continuously improve the quality of teaching.

This guideline offers you a systematic approach to developing meaningful learning outcomes. The template is divided into the following sections:

- Curriculum Unit Title: title of the curriculum unit
- Workload: expected workload of the unit in hours
- Contact hours: expected learning hours of the unit
- Description: a general description of the curriculum unit
- Learning Outcomes: objectives, overall goal of the unit; Knowledge, Skills, Autonomy & Responsibility out of the ESE Professional Profile
- Teaching and Learning Activities: all activities carried out in this unit
- Assessment: assessment tasks to be assessed on their achievement of this specific outcome
- External Resources: additional resources to gain further information

An additional table of learning outcomes focuses on the concrete and measurable description of what students should know, understand and be able to do after successfully completing the course. Each line should list one outcome, the associated teaching and learning activities, and the assessment method.

Here are some formulation aids which help you define and write learning outcomes based on Cedefop (2022, pp. 78)[1]:

- Learning outcomes are student-centred, competence-oriented, measurable, verifiable, and transparent.
- Keep the number of statements as few as possible, so the learner can relate to the intentions and engage in the learning, and the teacher can plan more easily.
- Start with an action verb, followed by the object of the verb, a statement specifying the depth of learning, and an indication of the context.
- Only one action verb for each learning outcome.
- Write precise learning outcomes and avoid ambiguity.

[1] Cedefop (2022). Defining, writing and applying learning outcomes: a European handbook - second edition. Luxembourg: Publications Office. http://data.europa.eu/doi/10.2801/703079

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The basic structure of learning outcomes (Cedefop, 2022, p. 79):

Basic structure:	Address the learner	One action verb	Object and scope of the expected learning	Relevant context
Example:	The learner	is expected to distinguish between	the environmental effects	of cooling gases used in refrigeration systems.

Use this template as a working basis for developing or revising your own learning outcomes. The structured approach helps you formulating precise and competence-oriented learning outcomes that provide your students with clear guidance and lay the foundation for successful teaching and learning processes. The template of the curriculum unit provides a structured overview and has all the important information at a glance.

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Overview of the curriculum unit

Curriculum Unit x: Title	**Workload: *xx* hours** **Contact hours: *xx* hours**
Description (A general description of the Curriculum Unit)	
Learning Outcomes (Objectives – Overall goal of the unit) Having taken this course, European Sustainability Experts (ESE) will be able to:	

Knowledge	**Skills**	**Autonomy & Responsibility**
•	•	•

Teaching and Learning Activities

The participants (European Sustainability Experts (ESE)) will be taught to achieve this specific outcome through the following learning activities:

-

Assessment

The participants (European Sustainability Experts (ESEs)) will be assessed on their achievement of this specific outcome through the following assessment tasks:

-

External Resources

-

Specifications of the Learning Outcomes

Outcome	Teaching and Learning Activities	Assessment
Having taken this course, European Sustainability Experts (ESEs) will be able to:	**The participants (European Sustainability Experts (ESEs)) will be taught to achieve this specific outcome through the following learning activities:**	**The participants (European Sustainability Experts (ESEs)) will be assessed on their achievement of this specific outcome through the following assessment tasks:**
Example: The learner becomes familiar with how innovative communication technology can be used to create sustainable solutions.	Example: SWOT analysis exercise to deeply analyse the use of digital tools for sustainable solutions.	Example: Building on the previous activities, learners will be invited to select a digital tool and create a short section of training content with regard to a specific sustainability issue in their own contexts.

4. Competence Matrix

The European Sustainability Expert Course Curriculum aims at developing participants' knowledge, skills, autonomy and responsibility towards a sustainability manager. After completing the course, learners have developed competencies that meet the needs of individuals, companies and economy as a whole in various sustainability-relevant sectors. Designed around the ESG reporting requirements and informed by the ESCO Classification and various international Skills Intelligence Reports, the course will focus on key transversal and technical skills relevant to business needs.

As the course is designed at EQF Level 5, it reflects an intermediate level of complexity, combining theoretical knowledge with practical application. Pre-requirements for enrolling in the course are, on the one hand, successful completion of EQF Level 4[2], which asks for "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", and "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". And on the other hand, participants should be either working, studying or being interested in developing their green competencies.

The course is accredited with 5 ECVET points and comprise a total of 125 learning hours which will include 10 contact hours of asynchronous, self-directed, online learning (structured, directed learning time built into the course, during which learners engage directly with the module content and resources such as expert videos, case studies, and interactive diagrams) and 4 self-study/practice hours for independent reading, practice and reflection (additional time learners spend independently consolidating their knowledge and skills through activities such as self-directed reading, exploration of additional resources, completion of practice exercises, and reflection on the course content).

This Competence Matrix builds the framework of the European Sustainability Expert Curriculum and consists of 9 Competence Units. Each unit gives an overview of the topic, the intended learning outcomes (knowledge, skills, autonomy and responsibility), teaching and learning activities, assessment, and external resources.

Here is an overview of the 9 Competence Units:

[2] According to Europass (https://europass.europa.eu/en/description-eight-eqf-levels)

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Competence Unit	Topic	Responsibility
1	Introduction to Business Sustainability	ISQ
2	Sustainability Science	GIE
3	Ways of Thinking	ISQ
4	Data Collection & Management	BFI
5	Sustainability Plan Development & Implementation	BFI
6	Sustainable Finance and Operations	UPB
7	Carbon Accounting & Reporting	SRC
8	Change Management and Trans disciplinarity	CBI
9	Environmental Legislation & ESG Reporting and Auditing	CBI

In the following, you can find the outlines of the curriculum units 1-9.

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4.1 Curriculum Unit 1: Introduction to Business Sustainability (Climate change fundamentals)

Created by ISQ

Curriculum Unit 1: Introduction to Business Sustainability (Climate change fundamentals)	**Workload: 15 hours** **Contact hours: 8 hours**

Description

This unit introduces the foundational concepts of business sustainability, contextualising the impact of climate change and the importance of sustainable practices for 21st-century enterprises. Participants will explore sustainable business models, resource consumption, biodiversity, and the role of sustainable communities in a green economy.

Learning Outcomes

Having taken this course, European Sustainability Experts (ESE) will be able to:

Knowledge	**Skills**	**Autonomy & Responsibility**
• Demonstrate understanding of the key concepts of business sustainability and its triple bottom line benefits (social, environmental, economic).	• Evaluate business models through a sustainability lens, identifying strengths and weaknesses. • Design corporate interventions aimed at reducing environmental impacts and carbon emissions.	• Evaluate business models through a sustainability lens, identifying strengths and weaknesses. • Design corporate interventions aimed at reducing environmental impacts and carbon emissions.

• Analyse the environmental impacts of corporate activities, including contributions to climate change and biodiversity loss. • Explain the principles of green economy and the role of sustainable communities in sustainability transitions. • Interpret sustainability-related international standards and frameworks (e.g. UN SDGs, ISO 14001, GRI). • Assess the relationship between environmental risks and strategic corporate planning, including sustainability reporting and compliance.	• Lead initiatives that promote a culture of environmental awareness and integrate sustainability into corporate practices. • Advise senior management on integrating sustainability goals into business strategy and operations. • Conduct sustainability risk assessments across supply chains, proposing mitigation strategies.	• Lead initiatives that promote a culture of environmental awareness and integrate sustainability into corporate practices. • Advise senior management on integrating sustainability goals into business strategy and operations. • Conduct sustainability risk assessments across supply chains, proposing mitigation strategies.

Teaching and Learning Activities

The participants (European Sustainability Experts (ESE)) will be taught to achieve this specific outcome through the following learning activities:

- Online lectures on sustainability and climate change fundamentals,
- Online lectures introducing core sustainability frameworks and current climate policy debates,
- Case study analyses of sustainable companies, including impact assessments and strategy redesign,
- Problem-based learning activities (PBL) where learners respond to real-world business sustainability dilemmas,

- Peer-led debates and structured argumentation sessions using current sustainability controversies,
- Interactive design thinking workshops, using tools like Miro or Jamboard, to develop sustainability interventions,
- Development of a digital portfolio with annotated reflections, solution proposals, and self-assessment.

Assessment

The participants (European Sustainability Experts (ESEs)) will be assessed on their achievement of this specific outcome through the following assessment tasks:

- Case study presentation (online), analysing a company's sustainability strategy and proposing alternative strategies for improvement, based on sustainability frameworks and standards,
- Written impact assessment report, evaluating the environmental, social and economic consequences of a business model and proposing alternative strategies to improve sustainability performance, with reference to climate change and biodiversity considerations,
- Sustainability action plan, individually or in small teams, including KPIs, risk assessment, and alignment with global standards (e.g. SDGs, GRI), demonstrating practical applications of sustainability frameworks,
- Participation in online forums and collaborative activities.

External Resources

- **Ellen MacArthur Foundation – Circular Economy Reports and Tools**
  ➤ https://ellenmacarthurfoundation.org/
- **European Commission – Sustainability for SMEs and Green Transition**
  ➤ https://single-market-economy.ec.europa.eu/smes/sme-strategy/sustainability_en
- **Intergovernmental Panel on Climate Change (IPCC)** – *Assessment Reports and Summaries for Policymakers*
  ➤ https://www.ipcc.ch/
- **GRI – Global Reporting Initiative Standards**
  ➤ https://www.globalreporting.org/

- **ISO 14001 – Environmental Management Systems (EMS)**
  ➤ https://www.iso.org/iso-14001-environmental-management.html
- **OECD – Environmental Performance Reviews and Green Growth Indicators**
  ➤ https://www.oecd.org/environment/

4.2 Curriculum Unit 2: Sustainability Science

Created by GIE

Curriculum Unit 2: Sustainability Science	**Workload: 16 hours** **Contact hours: 8 hours**

Description

This unit presents relevant topics related to "Sustainability Science", namely: Sustainable education; UN Sustainability development goals (SDGs); Greenhouse-gases (GHG); Climate Change; Sustainability Challenges. Through self-learning activities, research and discovery, critical thinking, and analysis, the learners will obtain valuable knowledge and will achieve specific skills, while also developing autonomy and responsibility necessary for the qualification "European Sustainability Expert (ESE)". Concepts, definitions, descriptions, explanations, and examples will be provided to learners, together with instructions on how to effectively use practical instruments and strategic documents (i.e., UN Report 2024 on the "Progress towards the Sustainable Development Goals"; SDG Action Manager tool) to better master their roles and responsibilities as sustainability experts.

Learning Outcomes

Having taken this course, European Sustainability Experts (ESE) will be able to:

Knowledge	**Skills**	**Autonomy & Responsibility**
• Define the concepts of "Sustainable Education" and "Sustainability Education" • Recognise the main types and sources of greenhouse gases and	• Explain the differences and similarities between the concepts of "Sustainable Education" and "Sustainability Education"	• Demonstrate comprehension of the need for 'taking action' and efficiently use the SDG Action Manager tool

their roles in the greenhouse effect. • Understand the carbon footprint and carbon credits • Understand climate change • Recognise the current sustainability challenges	• Express (indicative) curricular themes/areas relevant for Sustainable/Sustainability Education • Analyse the 17 SDGs • Analyse the need for and justify the relevance of the 17 SDGs • Describe the features & functionality of the SDG Action Manager tool • Analyse the effect of the GHG • Acknowledge the envisaged climate targets	• Evaluate and consider GHG reduction strategies • Value the importance and applicability of the European Climate Law • Analyse the determinants of the sustainability challenges

Teaching and Learning Activities

The participants (European Sustainability Experts (ESE)) will be taught to achieve this specific outcome through the following learning activities:

- Reading the provided definitions and explanations on the concepts *"Sustainable Education"* and *"Sustainability Education";* Reflecting and defining in own words the two concepts.
- Reading the provided explanations on differences and similarities between the concepts of *"Sustainable Education"* and *"Sustainability Education",* also reading the bibliographic resources on these topics, and finally reflecting upon correctly understanding the differences/similarities.

- Reading the resources given in the bibliography; Navigating the Internet to discover curricular themes/areas that are relevant for Sustainable/Sustainability Education; Creating a list with curricular themes/areas that participants could use to teach professionals under their responsibilities.
- Reading the resources given in the bibliography; Navigating the Internet to discover pedagogical approaches that are relevant for Sustainable/Sustainability Education; Creating a list with pedagogical approaches that participants could use to teach professionals under their responsibilities.
- Reading the provided explanations and the resources in the bibliography on the UN SDGs and the Ten Principles of the UN Global Compact.
- Performing Task 2.1.
- Performing Task 2.2 (watching the video and identifying the features & functionality of the SDG Action Manager tool); Verifying solution for Task 2.2.
- Signing up and navigating through the SDG Action Manager.
- Reading the provided GHGs' classification and their sources, examples.
- Reading the provided description and examples of the GHGs' effects.
- Reading the provided definition, explanations and description on the concepts of carbon footprint and carbon credits; Watching the video; Reading the Carbon Offset Guide.
- Reading the Case study on decarbonisation, reading about EU strategies to reduce greenhouse gases.
- Reading the provided definition, explanations and examples on climate change; Watching the video on climate change; Reading additional resources.

- Reading the provided information on the climate targets until 2030-2040-2050.
- Reading the provided information and the bibliographic resources about the European Climate Law.
- Reading the provided sustainability challenges and how they affect the European Union and Member States, Reading additional resources.
- Performing Task 5.1 (a SWOT analysis of the drivers of change, to identify and explain which drivers represent challenges and which opportunities, for sustainability).

Assessment

The participants (European Sustainability Experts (ESEs)) will be assessed on their achievement of this specific outcome through the following assessment tasks:

- Formulate the definitions of the two concepts ("Sustainable Education" and "Sustainability Education") in their own words.
- Provide explanations and examples to illustrate differences and similarities between "Sustainable Education" and "Sustainability Education".
- Create a list with the identified themes/areas relevant to Sustainable/Sustainability Education.
- Create a list of pedagogical approaches relevant for Sustainable/Sustainability Education; Check autonomously their preparedness to efficiently use these approaches.
- Autonomously check of recognition and understanding of the SDGs and Ten Principles.
- Reflect on the need for and the relevance of the 17 SDGs.
- Create a list with identified features & functionalities of the SDG Action Manager tool and check its correctness.

- Register and navigate through the SDG Action Manager.
- Self-assess the knowledge on the main types and sources of greenhouse gases.
- Self-assess the importance of reducing carbon emissions for environmental and societal well-being.
- Self-relate about footprint; Consider how individual and collective actions contribute to carbon footprint; Self-relate on how to calculate the company's carbon credits.
- Reflect on the implications of carbon emissions and on solutions for reducing farming's carbon footprint; Answer the questions in the Case Study.
- Explore examples of climate change relevant to their context.
- Self-assess their own level of understanding of climate targets until 2030-2040-2050, and on the areas where they wish to learn more.
- Reflect and self-explain how they would apply or verify the application of the law in their business or company.
- Self-relate to the sustainability challenges.
- Develop a brief Action Plan; Self-assess the Action Plan.

External Resources

- Alam, G. M., (2023). Sustainable Education and Sustainability in Education: The Reality in the Era of Internationalisation and Commodification in Education - Is Higher Education Different? *Sustainability*, *15*(2), 1315. https://doi.org/10.3390/su15021315

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- European Commission, *Climate strategies & targets*, https://climate.ec.europa.eu/eu-action/climate-strategies-targets_en
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- European Commission, *EU competences in the field of climate action*, https://climate.ec.europa.eu/eu-action/eu-competences-field-climate-action_en
- European Commission, *European Green Deal*, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

- European Environment Agency, *Drivers of change: challenges and opportunities for sustainability in Europe*, https://www.eea.europa.eu/en/topics/in-depth/sustainability-challenges/drivers-of-change-challenges-and-opportunities-for-sustainability-in-europe-1
- European Environment Agency, *State of Europe's environment not good: threats to nature and impacts of climate change top challenges*, https://www.eea.europa.eu/en/newsroom/news/state-of-europes-environment-2025
- European Environment Agency, *Sustainability Challenges*, https://www.eea.europa.eu/en/topics/in-depth/sustainability-challenges
- European Council of the EU, *Latest EU policy actions on climate change*, https://www.consilium.europa.eu/en/policies/climate-change/eu-climate-action/
- Foster International School, https://fosterinternational.edu.pk/sustainable-education-building-a-greener-future-through-learning/#:~:text=What%20is%20Sustainable%20Education?,students%20for%20real%2Dworld%20challenges
- GHG reduction strategies, https://ghgreduction.eu/
- Global Climate Initiatives, https://globalclimateinitiatives.com/en/agir-pour-le-climat-3-actions-essentielles-pour-reduire-les-emissions-de-ges/
- Greener Insights. *10 Key Sustainability Challenges to Tackle in 2025*, https://greenerinsights.com/10-key-sustainability-challenges-to-tackle-in-2025/

- Jeronen, E. (2022). *Sustainable Education*. In: Idowu, S., Schmidpeter, R., Capaldi, N., Zu, L., Del Baldo, M., Abreu, R. (eds) Encyclopedia of Sustainable Management. Springer, Cham. https://doi.org/10.1007/978-3-030-02006-4_237-1
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- Mike Berners-Lee, (2020). *The carbon Footprint of Everything*. Profile Books Ltd., London. ISBN 978-1788163811, eISBN 978-1782837114
- National Geographic, *Causes and Effects of Climate Change*, Climate+101+causes+and+effects
- National Geographic, *Global Warming Effects*, https://www.nationalgeographic.com/environment/article/global-warming-effects
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- UN Global Compact, (2025). *17 Goals to Transform Our World*, https://unglobalcompact.org/sdgs/17-global-goals#sdg1
- United States Environmental Protection Agency, *Carbon Footprint Calculator*, https://www.epa.gov/ghgemissions/carbon-footprint-calculator ;
- Unites States Environmental Protection Agency, *GHG Reduction Programs & Strategies*, https://www.epa.gov/climateleadership/ghg-reduction-programs-strategies
- University of Plymouth (2025). *What is Education for Sustainable Development?*, https://www.plymouth.ac.uk/students-and-family/sustainability/sustainability-education/esd
- UN Report 2024 on the *"Progress towards the Sustainable Development Goals"*, https://unstats.un.org/sdgs/files/report/2024/SG-SDG-Progress-Report-2024-advanced-unedited-version.pdf
- Youtube, https://www.youtube.com/watch?v=eTyM5qUEI_M&t=8s
- 21K School, https://www.21kschool.com/in/blog/sustainable-education/

4.3 Curriculum Unit 3: Ways of Thinking (Design, Futures, Circular, Systems)

Created by ISQ

Curriculum Unit 3: Ways of Thinking (Design, Futures, Circular, Systems)	**Workload: 12 hours** **Contact hours: 8 hours**
Description This unit focuses on developing thinking strategies essential to tackling complex sustainability challenges. Learners will explore design thinking, systems thinking, circularity and futures thinking as tools to create innovative and regenerative solutions.	
Learning Outcomes Having taken this course, European Sustainability Experts (ESE) will be able to:	
Knowledge • Apply the core principles of design thinking, systems thinking, circular economy, and futures literacy, and their application to sustainability transitions. • Distinguish and evaluate the 10Rs (Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture,	**Skills** • Master design thinking to co-create solutions to real-world sustainability problems. • Analyse business value chains using systems thinking tools. • Develop strategies aligned with the 10Rs to reduce waste and improve circularity.	**Autonomy & Responsibility** • Demonstrate creative and critical thinking when dealing with uncertain sustainability contexts. • Manage the implementation of forward-looking, sustainable ideas in specific domains.

Repurpose, Recycle, Recover) in circular strategies. • Assess the implications of shifting from paper-based processes to digital, sustainable alternatives. • Interpret ethical, social, and environmental considerations underpinning the use of future scenarios and circular design in complex systems. • Use digital tools and methodologies that support collaborative problem-solving in sustainability challenges.	• Prototype circular economy interventions using iterative, user-centred approaches. • Use collaborative digital platforms to facilitate co-design processes across distributed teams. • Assess the interconnections between social, environmental, and economic systems when proposing sustainable innovations.	• Act as a facilitator of innovative thinking within sustainability-focused teams or projects. • Lead interdisciplinary teams to co-create and evaluate long-term sustainable solutions. • Assume responsibility for embedding systemic thinking in organisational change initiatives. • Make autonomous, informed decisions under ambiguity using foresight tools and speculative design.

Teaching and Learning Activities

The participants (European Sustainability Experts (ESE)) will be taught to achieve this specific outcome through the following learning activities:

- Online workshops using advanced design thinking methodologies to frame and solve sustainability challenges,
- Interactive system mapping exercises, using real-world case data, to visualise circular relationships and feedback loops,
- Video case studies and scenario-based discussions and analysis,
- Group ideation and prototyping sessions using whiteboard and co-creation tools,
- Critical analysis of video case studies, followed by structured reflection and solution redesign,
- Debates (about the areas of SDGs and how they affect European and national issues),
- Peer-led micro-teaching, where each learner facilitates a mini-session on a systemic or circular design concept,

- Development of a reflective journal or video log, capturing insights, conceptual models and learning evolution.

Assessment

The participants (European Sustainability Experts (ESEs)) will be assessed on their achievement of this specific outcome through the following assessment tasks:

- Oral presentation (online) of a case study analysis, with strategic recommendations for improving sustainability performance,
- Group project applying design thinking to a local sustainability issue (presented online), showcasing creativity, innovation, and the application of circular economy principles to a real-world problem,
- Reflective journal entry, critically analysing decisions made, frameworks used and ethical considerations throughout the learning process,
- Analysis report on a process in their own context, referring to the SDGs and applying the 10Rs.

External Resources

- **Doughnut Economics – Kate Raworth**
  ➤ https://doughnuteconomics.org/
- **Circular Design Guide – IDEO & Ellen MacArthur Foundation**
  ➤ https://www.circulardesignguide.com/
- **UNESCO Futures Literacy Resources**
  ➤ https://en.unesco.org/futuresliteracy
- **The Systems Thinking Playbook – Meadows & Sweeney**
  ➤ https://donellameadows.org/systems-thinking-playbook/
- **European Environment Agency (EEA) – Circular Economy Reports and Systems Thinking in Policy**
  ➤ https://www.eea.europa.eu/themes/circular-economy

- **OECD – Scenarios for the Future of Sustainability**
  ➤ https://www.oecd.org/futures/
- **Design Council (UK) – Systems Thinking and Design for Planet**
  ➤ https://www.designcouncil.org.uk/resources/guide/design-systemic-change/
- **J. Potting, M. Hekkert, E. Worrell, and A. Hanemaaijer. 2017. "Circular Economy: Measuring Innovation in the Product Chain". Policy Report. Netherlands Environmental Assessment Agency**
  ➤ **https://www.researchgate.net/publication/319314335_Circular_Economy_Measuring_innovation_in_the_product_chain**

4.4 Curriculum Unit 4: Data collection & management

Created by BFI

Curriculum Unit 4: Data Collection & Management	**Workload: 15 hours** **Contact hours: 6 hours**

Description

This unit introduces methods and tools for collecting, processing, and managing data relevant to sustainability. Students will explore European data infrastructures, learn best practices in data governance and ethics, and gain hands-on experience with open-source workflows to ensure high data quality and reproducibility.

Learning Outcomes

Having taken this course, European Sustainability Experts (ESE) will be able to:

Knowledge	**Skills**	**Autonomy & Responsibility**
• Define key concepts in sustainability data governance and quality assurance. • Describe major European data repositories and regulatory frameworks (e.g., INSPIRE, GDPR). • Explain principles of data ethics and privacy in sustainability reporting.	• Apply statistical techniques to clean and preprocess environmental data sets. • Use open-source tools (e.g., R, Python) to visualise sustainability indicators. • Implement data validation methods to ensure integrity and consistency.	• Design a transparent and reproducible data collection plan for sustainability projects. • Critically evaluate ethical issues in data collection and stakeholder reporting.

• Summarise best practices for data documentation and metadata standards.	• Develop reproducible data workflows using version control systems.	• Advocate for data quality management processes within interdisciplinary teams.

Teaching and Learning Activities

The participants (European Sustainability Experts (ESE)) will be taught to achieve the specific outcomes through the following learning activities:

- Interactive lectures and case studies on European data governance frameworks.
- Hands-on lab: data cleaning with R.
- Tutorial: visualising sustainability indicators in Python.
- Case study analysis of EU sustainability reports.
- Reflection: ethics in data collection and stakeholder reporting.
- Independent project: develop a data collection plan and workflow

Assessment

The participants (European Sustainability Experts (ESEs)) will be assessed on their achievement of this specific outcome through the following assessment tasks:

- Multiple-choice quiz on data governance, ethics, and metadata.
- Data cleaning assignment (report & code).
- Visualisation project (report & presentation).
- Project work: data collection plan with ethical analysis (written report).

External Resources

- EU INSPIRE Geoportal: https://inspire.ec.europa.eu/
- Eurostat SDG Data Browser: https://ec.europa.eu/eurostat/web/sdi
- R tidyverse documentation: https://www.tidyverse.org/
- Python pandas & matplotlib tutorials: https://pandas.pydata.org/; https://matplotlib.org/
- Batini, C., & Scannapieco, M. (2016). Data and Information Quality.
- ISO 19115 Metadata Standard overview: https://www.iso.org/standard/53798.html

4.5 Curriculum Unit 5: Sustainability Plan Development & Implementation

Created by BFI

Curriculum Unit 5: Sustainability Plan Development & Implementation	**Workload: 15 hours** **Contact hours: 6 hours**

Description

This unit prepares European Sustainability Experts (ESE) to design, implement, and monitor comprehensive sustainability plans. Key themes include stakeholder analysis, resource allocation, sustainable product development, waste management strategies, and performance evaluation within European policy frameworks and ethical guidelines.

Learning Outcomes

Having taken this course, European Sustainability Experts (ESE) will be able to:

Knowledge	**Skills**	**Autonomy & Responsibility**
• Define core components of a sustainability plan, including vision, objectives, and metrics. • Describe stakeholder mapping techniques and engagement strategies.	• Apply stakeholder analysis tools to prioritise engagement efforts. • Develop a project timeline and resource plan using Gantt chart techniques.	• Lead a stakeholder workshop to refine sustainability objectives. • Evaluate ethical considerations in resource allocation and reporting. • Advocate for continuous improvement processes within interdisciplinary teams.

• Summarise principles of sustainable product design and circular economy models. • Explain waste management hierarchies and EU regulatory requirements. • Identify key performance indicators (KPIs) for monitoring sustainability initiatives.	• Use life-cycle assessment (LCA) software to evaluate product sustainability. • Design waste reduction initiatives conforming to EU circular economy principles. • Construct KPI dashboards to track sustainability plan performance.	

Teaching and Learning Activities

The participants (European Sustainability Experts (ESE)) will be taught to achieve the specific outcomes through the following learning activities:

- Interactive lecture: sustainability planning (addresses Knowledge outcomes 1–2).
- Case study: sustainable product development (addresses Knowledge 3; Skills 3).
- Workshop: stakeholder analysis (addresses Skills 1; Autonomy 1).
- Lab: project timeline & resource planning (addresses Skills 2).
- Tutorial: life-cycle assessment with LCA tools (addresses Skills 3).
- Reflection: waste management strategies (addresses Knowledge 4; Skills 4).
- Independent project: KPI dashboard creation (addresses Skills 5; Autonomy 3).

Assessment

The participants (European Sustainability Experts (ESEs)) will be assessed on their achievement of this specific outcome through the following assessment tasks:

- Multiple-choice quiz on planning concepts, stakeholders, and ethics (assesses Knowledge outcomes 1–5).
- Stakeholder analysis report (assesses Skills 1).
- Project plan assignment with Gantt chart and narrative (assesses Skills 2).
- LCA evaluation task with software output and commentary (assesses Skills 3).
- Waste management proposal (assesses Skills 4).
- KPI dashboard presentation (assesses Skills 5; Autonomy 3).

External Resources

- EU Circular Economy Action Plan: https://ec.europa.eu/environment/circular-economy/
- ISO 14001 Environmental Management overview: https://www.iso.org/iso-14001-environmental-management.html
- Global Reporting Initiative (GRI) Standards: https://www.globalreporting.org/
- UNEP Guidelines for Sustainability Plans: https://www.unep.org/resources
- OpenLCA software documentation: https://www.openlca.org/
- Project Management Institute (PMI) LCA white paper

4.6 Curriculum Unit 6: Sustainable Finance and Operations

Created by UPB

Curriculum Unit 6: Sustainable Finance and Operations	**Workload: *9* hours** **Contact hours: *5* hours**

Description (A general description of the Curriculum Unit)

European Sustainability Experts should be familiar with the topic of sustainable finance. What do sustainable financial transactions look like, and how can they be implemented at an operational level? Operational decisions are made daily by teams or individual employees to achieve the company's strategic goals. The following areas need to be considered:
- economic planning, implementation, evaluation and reporting

- Investments: sustainable investments, buildings, vehicle fleet, etc.

- Reporting: Corporate Sustainability Reporting Directive, European Sustainability Reporting Standards.

Curriculum Unit 6, "Sustainable Finance and Operations," will provide an overview of possible sustainable financial issues, focusing on investments and how these can be planned, implemented, and evaluated at an operational level. Additionally, the reporting framework of sustainable finance following European standards will be introduced.

Learning Outcomes (Objectives – Overall goal of the unit)

Having taken this course, European Sustainability Experts (ESE) will be able to:

- know about possibilities for sustainable investments,
- plan, perform and evaluate the sustainable investments,

- and report on sustainable investments in line with European standards.

Knowledge	Skills	Autonomy & Responsibility
• Understand the fundamental concepts and mechanisms of sustainable finance. • Demonstrate knowledge of sustainable investment instruments and their role in promoting long-term environmental and social value. • Demonstrate knowledge of international standards and frameworks for sustainability reporting. • Familiarity with key risks associated with sustainable finance and understanding strategies for managing them. • Understand environmental legislation and its implications for financial practices and sustainable investments.	• Critically evaluate financial and operational strategies in terms of sustainability impact. • Analyse business requirements and assess environmental and financial impacts to design sustainable financial products. • Communicate sustainability-related financial and operational strategies convincingly to diverse stakeholders. • Perform effective project management in the context of sustainable finance initiatives. • Coordinate environmental efforts in financial operations and integrate environmental considerations into financial planning.	• Lead the sustainability reporting process and take responsibility for communicating the organisation's sustainability performance. • Ensure compliance with environmental legislation in financial contexts and take accountability for legal and ethical outcomes. • Promote environmental awareness in financial decision-making and advocate for long-term sustainability goals. • Make autonomous, ethically grounded decisions in evaluating suppliers' sustainability performance. • Coordinate environmental efforts across departments and assume leadership in sustainability integration.

Teaching and Learning Activities

The participants (European Sustainability Experts (ESE)) will be taught to achieve this specific outcome through the following learning activities:

- Knowledge building through literature and learning videos
- Working on case studies
- Project work
- Reflection

Assessment

The participants (European Sustainability Experts (ESEs)) will be assessed on their achievement of this specific outcome through the following assessment tasks:

- Knowledge query
- Proposed solution to the case study
- Presentation of the project results
- Text of the self-reflection concerning the different activities

External Resources

- Literature on Sustainable Finance
  - Aliano, M., Cestari, G. & Madonna, S. (2024): Sustainable Finance for SMEs. The Role of Capital for Sustainable and Inclusive Growth. Springer.
  - Aras, G. (2025): Sustainable Finance for Sustainable Development. Regulations, Theory and Practice. Routledge.
  - Dickinson, K. (2012): Financial Markets Operations Management. Wiley.
  - OECD (2020): Developing Sustainable Finance Definitions and Taxonomies, Green Finance and Investment. OECD Publishing.
- Literature on Management

    - Bauer, P. (2024): A Comprehensive Project Management Guide. Quality Management, Integrated Six-Sigma and Change Management Compilation. Springer.

- Videos on Sustainable Finance
    - The EU Taxonomy: https://www.youtube.com/watch?v=1O6YCCbHvHc
    - EU Finance Podcast S02E11: The One about European Green Bonds going live!: https://www.youtube.com/watch?v=d6NCJ7m9VPE
- Videos on Management
    - 10 Management Skills Every Manager Should Have https://www.youtube.com/watch?v=JGosaTGJQt8
    - Management Process | Functions of Management process https://www.youtube.com/watch?v=q6LMjurECZM

4.7 Curriculum Unit 7: Carbon accounting & reporting

Created by SRC

Curriculum Unit 7: Carbon Accounting & Reporting	**Workload: 14 hours** **Contact hours: 7 hours**

Description

This unit introduces key topics in Carbon Accounting and Reporting, including greenhouse gas (GHG) emissions, global warming potential, carbon footprint, and decarbonisation. Learners will explore how emissions are categorised into Scopes 1, 2, and 3, using recognised standards. The module also covers mitigation strategies, EU and international reporting frameworks, as well as Environmental Social Governance (ESG) reporting requirements. Through a blend of guided learning, group discussions, practical exercises, and case studies, learners will expand their knowledge and skills in analysing emissions data, reporting, and recommending mitigation strategies.

Learning Outcomes

Having taken this course, European Sustainability Experts (ESE) will be able to:

Knowledge	**Skills**	**Autonomy & Responsibility**
• Describe key carbon accounting concepts, including global warming potential, carbon footprint, and decarbonisation.	• Categorise GHG emissions data using appropriate methods and tools (e.g., free tools such as Count Your Carbon and Sustainability Tool Carbon Calculator, or enterprise platforms	• Critically evaluate the role of ESG data in environmental accountability and defend its integration in sustainability reporting.

• Identify emissions sources into Scope 1, 2, and 3 using recognised frameworks. • Summarise the purpose and application of key standards such as the GHG Protocol and ISO 14064. • Interpret the main components of EU and international carbon reporting frameworks, including the CSRD and EU ETS. • Describe ESG reporting requirements and explain the importance of accurate data in environmental decision-making. • Recall mitigation strategies across sectors, including energy, agriculture, and water management. • Compare sustainable and organic farming practices with conventional approaches in terms of Green House Gas (GHG) reduction, biodiversity, and climate resilience.	like Microsoft Sustainability Cloud and IBM Environmental Intelligence Suite). • Calculate organisational emissions using carbon calculators and emission factors. • Analyse emissions data to identify environmental impacts and prioritise mitigation strategies. • Conduct a simplified life cycle assessment (LCA) using provided data, in line with ISO 14044. • Assess the impact of water use on emissions and develop strategies to improve water efficiency. • Evaluate sustainable farming practices in relation to EU policy objectives and climate action goals. • Prepare carbon emission reports aligned with EU/international requirements, incorporating ESG indicators.	• Collaborate with peers to review sustainability case studies and co-develop realistic, evidence-based mitigation strategies. • Reflect on the effectiveness of sector-specific mitigation strategies (e.g., in water or agriculture) and articulate their potential impact. • Simulate real-world reporting scenarios using mock data, demonstrating accountability and transparency. • Take ownership of communicating sustainability messages clearly to diverse audiences through written, verbal, or media-based formats (e.g., podcasts, infographics, or videos.

• Explain the function of carbon calculators and national inventory methods (e.g., DEFRA, EU tools). • Recognise major carbon emissions and air pollutants and describe their role in environmental-economic assessments.	• Communicate emissions insights using structured written reports and analytical visuals.	

Teaching and Learning Activities

The participants (European Sustainability Experts (ESE)) will be taught to achieve the specific outcomes through the following learning activities:

- Learners have access to modular learning content covering these key topics, along with supporting multimedia content (e.g., videos, infographics, and interactive quizzes).
- Learning content includes a recommended reading list and relevant resources with guiding questions to promote reflection.
- Learners complete online material explaining the three emission scopes, supported by digital examples and guided activities.
- Reflection prompts allow learners to explore the application of recognised standards (GHG Protocol, ISO 14064).
- Case studies and interactive learning materials allow learners to analyse environmental impacts from various sectors. Learners explore examples of mitigation strategies.

- Learners spend time working through the modular learning content, which covers different EU and international reporting frameworks (CSRD and EU ETS) with explanatory notes and examples.
- Learners review parts of real or mock sustainability reports to identify key components and effective writing techniques.
- Learners explore multimedia content linking water use to carbon emissions.
- Learner's research effective strategies for improving water efficiency and reducing associated GHG emissions within organisational settings.
- Learners engage with video lectures and reading materials on organic farming and GHG reduction, mapping emissions within the food supply chain and linking them to Scope 1, 2, or 3 categories.
- Learners complete online modular content explaining how different gases and pollutants affect the environment and introduces a basic carbon calculator and national emissions inventory tools (e.g., DEFRA, EU databases).
- Learners practice calculating emissions using a sample dataset.
- Use provided emissions data to conduct a basic life cycle assessment (LCA) in line with ISO 14044.

Assessment

The participants (European Sustainability Experts (ESEs)) will be assessed on their achievement of the specific outcomes through the following assessment tasks:

- Online quiz with multiple choice questions to check understanding of key concepts.
- Multiple-choice questions assessing learners' ability to correctly categorise emissions and recognise relevant standards.
- Multiple-choice questions focusing on identifying key environmental impacts and suitable mitigation strategies.

- Multiple-choice questions assessing learners' understanding of EU and international reporting frameworks and ESG principles.
- Multiple-choice questions testing learners' ability to identify relationships between water use, emissions, and mitigation strategies.
- Multiple-choice questions evaluating understanding of sustainable agricultural practices and their alignment with EU policy goals.
- Multiple-choice questions testing learners' understanding of air emissions data and use of emissions calculators.

External Resources

- EU Emissions Trading System (EU ETS): https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en
- Questions and Answers on the Adoption of European Sustainability Reporting Standards: https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_4043
- What is Carbon Accounting: https://www.ibm.com/think/topics/carbon-accounting
- Environmental accounts - establishing the links between the environment and the economy: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Environmental_accounts_-_establishing_the_links_between_the_environment_and_the_economy
- Environmental Footprint Methods: https://green-forum.ec.europa.eu/environmental-footprint-methods_en
- Corporate Sustainability Reporting Regulations: https://enterprise.gov.ie/en/what-we-do/the-business-environment/corporate-sustainability-reporting/

- Corporate sustainability reporting: https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en
- What are scope 1, 2 and 3 carbon emissions: https://www.nationalgrid.com/stories/energy-explained/what-are-scope-1-2-3-carbon-emissions
- The Role of Organic Farming in Reducing Greenhouse Gas Emissions from Agriculture in the European Union: https://www.mdpi.com/2073-4395/15/1/198
- Water Footprint Network: https://www.waterfootprint.org/water-footprint-2/what-is-water-footprint-assessment/
- Climate Toolkit 4 Business: https://climatetoolkit4business.gov.ie/
- EPA Sustainable Business Resources: https://www.epa.ie/our-services/monitoring--assessment/circular-economy/circular-and-sustainable-sectors/greening-resources-for-business/#d.en.87049
- EPA Tool for Resource Efficiency: https://greenbusiness.ie/sme-efficiency-and-cost-reduction-questionnaire/
- EEA greenhouse gases — data viewer: https://www.eea.europa.eu/en/analysis/maps-and-charts/greenhouse-gases-viewer-data-viewers
- Example GHG Report (New Zealand Government): https://environment.govt.nz/assets/Publications/Files/example-ghg-report.pdf
- Life cycle assessment (LCA) - The ultimate guide for beginners: https://www.hhc.earth/knowledge-base/guides/lca-life-cycle-assessment

4.8 Curriculum Unit 8: Change Management and Trans disciplinarity

Created by CIB

Curriculum Unit 8: Change Management and Transdisciplinarity	**Workload: 12 hours** **Contact hours: 8 hours**

Description

In a continuously changing world, creating sustainable transformation requires more than simply the proper technologies or policies; it also requires understanding people, building trust, and bringing diverse perspectives together. This unit will teach you how to be a confident guide through change. Learners will learn how to assist teams and communities transition to more sustainable ways of working and living. They will learn what makes change successful (or fail), how to effectively involve others, and how to collaborate across industries and disciplines to address real-world problems. Whether you are assisting a company in reducing its environmental footprint or collaborating with local communities on green solutions, this course will teach learners the mindset and strategies for leading change with empathy, clarity, and impact.

Learning Outcomes

Having taken this course, European Sustainability Experts (ESE) will be able to:

Knowledge	**Skills**	**Autonomy & Responsibility**
• Understand key theoretical models of change management applicable to sustainability.	• Apply change management methods to facilitate the transition towards sustainable practices in organisations and communities.	• Take an active role in promoting and managing sustainable change, leading multidisciplinary teams.

• Know the concept of trans disciplinarity and its relevance in addressing complex environmental, economic, and social issues. • Recognise the role of leadership and effective communication in change processes.	• Integrate knowledge and approaches from different disciplines to co-create sustainable solutions with cross-sector stakeholders. • Facilitate participatory workshops and collaborative decision-making processes.	• Act responsibly in supporting inclusive transformative processes, considering ethical and social implications. • Critically monitor the impact of implemented changes and propose continuous improvement strategies.

Teaching and Learning Activities

The participants (European Sustainability Experts (ESE)) will be taught to achieve this specific outcome through the following learning activities:

- Interactive lectures and case studies on sustainable transition projects.
- Workshops focused on practising facilitation methods and strategies to effectively engage stakeholders.
- Simulations of co-design and change management processes.

Assessment

The participants (European Sustainability Experts (ESEs)) will be assessed on their achievement of the specific outcomes through the following assessment tasks:

- Short quizzes or knowledge checks at the end of each module to assess participants' understanding of key concepts related to sustainable change and change management.
- Project-based assessment: researching a real-world organisation or community initiative and proposing a sustainable change management plan using the concepts learned in the training.

External Resources

- Burnes, B. (2017). Managing change (7th ed.). Pearson Education.
- Lewin, K. (1951). Field theory in social science. Harper & Row.
- Maslow, A. H. (1943). A theory of human motivation. Psychological Review, 50(4), 370–396. https://doi.org/10.1037/h0054346
- Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: From national systems and "Mode 2" to a triple helix of university–industry–government relations. Research Policy, 29(2), 109–123. https://doi.org/10.1016/S0048-7333(99)00055-4

4.9 Curriculum Unit 9: Environmental Legislation & ESG Reporting and Auditing

Created by CIB

Curriculum Unit 9: Environmental Legislation & ESG Reporting and Auditing	**Workload: 12 hours** **Contact hours: 8 hours**

Description

This unit offers European Sustainability Experts (ESEs) an in-depth understanding of the European and international environmental legal frameworks, ESG reporting standards, and auditing procedures. Learners will learn practical skills for analysing legislation, utilising ESG frameworks (e.g., GRI, CSRD), and conducting internal audits to ensure sustainability compliance and corporate responsibility.

Learning Outcomes

Having taken this course, European Sustainability Experts (ESE) will be able to:

Knowledge	**Skills**	**Autonomy & Responsibility**
• Understand the structure, objectives, and key instruments of EU and international environmental legislation. • Identify major ESG frameworks and reporting obligations (e.g., CSRD, EU Taxonomy, GRI, SASB).	• Analyse and interpret relevant environmental laws and ESG compliance obligations for companies and organisations. • Prepare and assess ESG reports in line with recognised reporting frameworks.	• Support organisational ESG strategies by integrating legislative compliance and transparent reporting practices. • Advise on corporate sustainability performance improvements based on audit findings.

• Describe the principles and standards behind ESG auditing, reporting cycles, and assurance mechanisms.	• Conduct internal audits related to sustainability performance and compliance.	• Take responsibility for the ethical and professional application of ESG principles in diverse work settings.

Teaching and Learning Activities

The participants (European Sustainability Experts (ESE)) will be taught to achieve this specific outcome through the following learning activities:

- Case study analyses on real-world ESG reports and environmental legal cases.
- Practical exercises in ESG report preparation and audit simulation tasks.
- Recorded tutorials on EU Green Deal legislation and ESG frameworks.

Assessment

The participants (European Sustainability Experts (ESEs)) will be assessed on their achievement of this specific outcome through the following assessment tasks:

- Online quizzes testing comprehension of legislative frameworks and ESG standards.
- Analytical report evaluating an existing ESG report or sustainability disclosure.
- Creation of a mini ESG audit plan, including a compliance checklist and improvement recommendations.

External Resources

- Balocco, V. (2021a, February 14). Responsabilità sociale e ambientale: il valore che c'è, ma non si vede - ESG360. ESG360. https://www.esg360.it/esg-world/responsabilita-sociale-e-ambientale-il-valore-che-ce-ma- non-si-vede/
- Balocco, V. (2021b, June 28). Epson e la sostenibilità: un percorso lungo cinquant'anni - ESG360. ESG360. https://www.esg360.it/environmental/epson-e-la-sostenibilita-un-percorso-lungo-cinquantanni/

- ConsumerLab.it. (2023, April 17). HIGH PERFORMER INDEX FUTURE RESPECT 2022 - ConsumerLab. ConsumerLab. https://www.consumerlab.it/high-performer-index-future-respect-2022/
- Redazione. (2024, August 20). Che cos'è la TCFD (Task Force on Climate-Related Financial Disclosures)? ESG360. https://www.esg360.it/finance-esg/la-tcfd-task-force-on-climate-related-financial-disclosures/

5. Training Methodology (UPB)

5.1 Introduction

The training course “European Sustainability Expert” was designed to develop competencies in various sustainability-relevant sectors that meet the needs of individuals, companies, and economy as a whole. In the long term, it should close the green gap in order to pursue sustainability strategies in companies in Europe and achieve European goals.

The chosen methodology is designed to promote sustainable learning processes and encourage participants to actively engage with the content. It combines proven didactic approaches with innovative methods and digital tools to ensure a high degree of practical relevance and motivation.

As the course is offered as a continuing education and training opportunity, it is assumed that the target group is already engaged in other activities and therefore has limited time. To make the course as flexible as possible, allowing everyone, to participate regardless of their circumstances, it has been designed to be 100% online and self-directed.

5.2 Pedagogical framework

The training concept is based on a constructivist learning approach, as the learners actively construct their knowledge individually. A pedagogical framework like this is important because it provides a clear, structured foundation for how teaching and learning are designed, delivered, and evaluated. Its importance can be understood in several key way: It offers Guides teaching practice and helps educators decide *how* to teach, not just *what* to teach. It shapes choices about instructional strategies, learning activities, assessment methods, and classroom interactions, ensuring teaching is intentional rather than ad hoc. Moreover, it promotes consistency and coherence. This means, when teachers work within a shared framework, learning experiences become more consistent across classes, subjects, or institutions. This coherence helps students understand expectations and supports smoother progression through learning stages. In addition to that, it supports effective student learning because our pedagogical framework is grounded in learning theories (such as constructivism, etc.). This ensures that teaching approaches align with how students learn best, increasing engagement, understanding, and retention. Moreover, it aligns curriculum, instruction, and assessment. A strong framework like ours connects learning objectives, teaching methods, and assessment practices. This alignment ensures that what is taught, how it is taught, and how learning is measured all work toward the same goals.

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Therefore, a pedagogical framework encourages reflective and evidence-based practice. Educators can use a pedagogical framework to reflect on their teaching, evaluate what works, and make informed improvements. It provides a shared language for professional discussion and continuous development. Nevertheless, the framework also supports inclusivity and equity and enhances accountability and quality assurance. The use of our pedagogical frameworks helps to define standards of teaching quality. It helps to demonstrate accountability to stakeholders and support curriculum review, accreditation, and policy development.

5.2.1 Constructivist learning approach

"Information can be transmitted, but knowledge must be constructed. This construction cannot be done by the teacher for the students but by the learners themselves." (Isaacson, 2025, p. 40). This quote summarises the goal of the constructivist learning approach perfectly. Learners are supposed to create their own learning processes within a modern and creative environment which an instructor offers. The environment is based on where the learners stand, hence adapts to their needs (Bremner, Sakata & Cameron, 2022).

The learners get topics and information of interest, dive into them, get questions, ask questions and create their own answers. The learning environment encourages learners to construct their own paths of understanding and broaden their knowledge and skills. Through regular feedback loops, learners can reflect on their processes at different stages of development. If necessary, they can adapt their learning processes and further steps.

Self-learning is an essential part, as the learners are responsible for themselves (Bremner, Sakata & Cameron, 2022). Through self-regulated learning, learners plan, perform, and reflect on their learning processes all by themselves (Zimmerman, 2002). According to Zimmerman (2002), learning is viewed as a proactive process. In their self-learning phases, learners use the content, instructions, food for thought, assistance and understanding, connect and categorise these. Action-orientation, learner-centration, and practical relevance are the focus of this learning approach.

5.2.2 Action-orientation

In line with the constructivist learning approach is action-oriented learning. This principle highlights once again the learners being active and creating their own learning processes, which include regular planning, development and evaluation: "Action-oriented learning is more than the doings, the execution of the task. What matters, is

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the increasingly independent planning, execution and evaluation." (Lindemann, 2002, p. 3).

5.2.3 Learner-centration

With the shift of the teacher being the passive instructor who offers learning environments, the focus shifts to the learner. As a result, teachers are looking at what the learners need rather than what the teachers need to do. The learner is at the centre of the planning process, the development of the learning materials, and the evaluation.

5.2.4 Practical relevance

The learning activities, methods, materials, and tasks are designed and prepared in such a way that heterogeneous and diverse groups can solve them. For being able to apply the learning content outside of the learning environment, the content has practical relevance to the learners (Isaacson, 2025).

5.3 Design of the training course

The training course "European Sustainability Expert" is modular and comprises 9 Curriculum Units. These 9 units cover a wide range of relevant topics. The topics relevant for a European Sustainability Expert and therefore the content of the curriculum are:

1. Introduction to Business Sustainability
2. Sustainability Science
3. Ways of Thinking
4. Data Collection & Management
5. Sustainability Plan Development & Implementation
6. Sustainable Finance and Operations
7. Carbon Accounting & Reporting
8. Change Management and Trans disciplinarity
9. Environmental Legislation & ESG Reporting and Auditing

Each unit follows a clear structure:

- Description: A general description of the Curriculum Unit
- Learning Outcomes: Objectives – Overall goal of the unit (Knowledge, Skills, Autonomy & Responsibility after completion of the unit)
- Teaching and Learning Activities: Methods and what they are supposed to do

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- Assessment: The participants will be assessed on their achievement of the outcomes through assessment tasks
- External Resources: Additional resources for learners (videos, texts, websites, etc.)

The contents of the units are based on theEuropean Centre for the Development of Vocational Training (CEDEFOP), European Skills, Competences, Qualifications and Occupations (ESCO) description of a Sustainability Manager, the ESE profile, and the learning outcomes.

The specified workload in hours in each unit is a guideline that learners can use as a reference. The workload indicates the total time, while the contact hours indicate how many hours are spent working with the material. There are no contact hours in person, as it is a fully online course. In addition, it is up to the learners themselves to decide how much time they spend working with the additional resources.

As part of the self-directed learning process, learners can decide whether they would like to go through all the units, or just a few of them, whether they go in order or not.

The course is freely accessible on the internet and can be accessed from any device, anywhere and at any time. The learners are responsible for organising their learning process.

5.4 Teaching and learning activities

Modern and creative learning activities shape a learner-friendly environment, which is crucial within a constructivist approach (Isaacson, 2025). Teachers provide the learners a variety of different kinds of activities which require them to think, find the problem and create a solution themselves. Therefore, multimedia learning formats should be offered.

A variety of methods are used in the course, such as

- online lectures on the unit's content
- case studies (text and video) of the relevant content of the unit with practical relevance
- problem-based learning activities concerning real-world issues
- debates of controversies within the unit's content
- interactive workshops
- development of digital portfolios, reflective journals or video logs
- design thinking
- interactive system mapping
- critical thinking and analysis
- hands-on lab

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- tutorials
- independent projects
- literature (recommended reading list, relevant resources)
- learning videos
- simulations of processes.

Digital tools such as Whiteboard, Mentimeter (https://www.mentimeter.com), or Padlet (https://padlet.com) support collaborative learning processes and enable asynchronous exchange.

Practice-oriented exercises promote the transfer to everyday working life. Through the connection to real-life settings, learners can transfer their knowledge into their practices (Isaacson, 2025). Therefore, case studies of real-life issues have been chosen to work with.

5.5 Evaluation

Formative and summative evaluations are two fundamental approaches to assessing learning, and they serve different purposes in education. The evaluation of the course includes both of these kinds: formative and summative.

A core issue of formative evaluation is to monitor student learning and provide ongoing feedback that can improve teaching and learning. With formative assessment, the learners will be assessed in each unit. By carrying out reflection and assessment tasks, they will be able to observe their learning processes. Clarities and difficulties become apparent, and they have the opportunity to improve and re-evaluate after each unit.

Examples for formative evaluation are:

- Quizzes or polls during a lesson
- Class discussions or questioning
- Draft assignments or peer review
- Observations and feedback on student performance

The summative assessment is at the end of the course and will be described in detail in the next chapter. The idea is to measure and summarise student learning at the end of an instructional unit, course, or program.

Examples for summative evaluation are:

- Final exams or standardised tests
- End-of-term projects or presentations
- Final essays or research papers
- Certification or licensure exams

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Evaluation and assessment are not the same, but they often go hand in hand.

5.6 Further development

Even though the course offers a well-thought-out, broad spectrum of methods and is ready for implementation, we would like to conclude by listing some ideas on how the course could be further developed . These ideas are primarily aimed at users, trainers, teachers, and companies.

- Include discussion forums for learners and others to discuss questions and help each other
- Include gamification elements like badges or scoring systems
- Include storytelling elements for real-life cases
- Include the option of learners becoming trainers for others, if they are very good at some unit content
- Include local and global sustainability initiatives (e.g., renewable energy projects, circular economy models, conservation programs) in case studies, so that they can be analysed, and critically evaluate successes, challenges, and lessons learned
- Include experiential learning: recommendations to field trips to sustainable farms, recycling centres, green buildings, or environmental NGOs can be supportive and hands-on projects, like designing a community garden, energy audit, or waste-reduction plan, can foster learning, too.
- Include service learning: learners may collaborate with local communities on sustainability initiatives
- Emphasise interdisciplinary approaches: connect sustainability to economics, social sciences, technology, and policy, and the learners may explore topics like environmental justice, climate finance, or sustainable supply chains. The idea is to encourage students to see the *systems thinking* perspective. To foster Policy and Advocacy, there is also the option to include discussions on environmental laws, international agreements (Paris Agreement, SDGs), and corporate sustainability reporting.
- Include simulations of political debates

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6. Summative Assessment Overview (ISQ)

6.1 Purpose and Scope

The summative assessment overview chapter is the gateway to certification. It ensures that only those who have truly acquired the necessary sustainability competences—validated through rigorous, transparent, and quality-assured assessment—are awarded the SUSTAIN-EU Digital Certificate, which is recognised across Europe as proof of expertise in sustainability.

The scope of the summative assessment is comprehensive, covering every core competence in the ESE curriculum, supporting both full certification and modular micro-credentials, and leveraging the advantages of a modern e-learning environment.

6.2 Assessment of Philosophy and Principles

6.2.1 Competence-Based, Learning Outcomes-Oriented

The SUSTAIN-EU assessment system is grounded in a competence-based approach, where assessment is explicitly mapped to Learning Outcomes (LOs) for each Competence Unit (CU). This mapping covers three domains—Knowledge, Skills, and Autonomy & Responsibility—aligned with the European Qualifications Framework (EQF) Level 5 and the ESCO (European Skills, Competences, Qualifications and Occupations) standards.

Learning Outcomes as the Foundation:

Learning outcomes define what a learner is expected to know, understand, and be able to do after completing a learning process. Assessment tasks are designed to measure the achievement of these outcomes, ensuring transparency and alignment with professional requirements (Adam, 2004; Kennedy, Hyland & Ryan, 2006).

Competence Beyond Knowledge:

The focus is not only on the recall of information but on the demonstration of practical application and professional behaviours in authentic or simulated contexts. This reflects the shift from knowledge-based to competence-based education, as advocated by the European Commission (Cedefop, 2017; Mulder, 2014).

Three Domains of Learning Outcomes:

- Knowledge: Facts, principles, theories, and practices relevant to sustainability.
- Skills: The ability to apply knowledge and use tools, methods, and procedures (e.g., analysing data, developing sustainability plans).

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- Autonomy & Responsibility: The capacity to work independently, make decisions, and take responsibility in a professional context (EQF, 2017).

Authentic Assessment:

Assessment tasks are designed to mirror real-world challenges and professional practices, supporting the development of job-ready graduates. (Gulikers, Bastiaens & Kirschner, 2004; Wiggins, 1990).

6.2.2 Alignment with European Standards

The SUSTAIN-EU assessment framework is explicitly aligned with the most relevant European standards for vocational education and training (VET), ensuring that the certification of European Sustainability Experts (ESE) is credible, portable, and recognised across Europe. Two key reference frameworks underpin this alignment: the European Qualifications Framework (EQF) and the European Skills, Competences, Qualifications and Occupations (ESCO) classification. By mapping assessment tasks and learning outcomes to EQF Level 5 descriptors, SUSTAIN-EU ensures that certified learners demonstrate not only knowledge, but also the ability to apply it in real-world situations with a degree of independence and responsibility expected of professionals in sustainability roles.

- EQF Level 5: Describes competences that combine theoretical knowledge with practical skills and a degree of autonomy and responsibility suitable for advanced VET and professional roles.
- ESCO: Provides standardised descriptions of job profiles and competences, ensuring recognition and comparability across Europe.

ESCO is the multilingual classification system developed by the European Commission to describe, identify, and categorise skills, competences, qualifications, and occupations relevant for the EU labour market and education and training. ESCO:

- Provides standardised, up-to-date descriptions of job profiles and competences, including those for sustainability managers and related roles.
- Facilitates the recognition and comparability of qualifications and competences across Europe, supporting mobility and employability.
- Ensures that the SUSTAIN-EU curriculum and assessment are directly linked to the actual needs of the European labour market and reflect the language and structure used by employers, educators, and policymakers.

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By aligning the ESE curriculum and assessment with ESCO, SUSTAIN-EU guarantees that its digital certificate and micro-credentials are meaningful and relevant for both learners and employers throughout Europe.

Standard	What it provides	How SUSTAIN-EU aligns
EQF Level 5	Describes knowledge, skills, autonomy & responsibility for advanced VET/professional roles	All CUs and assessments mapped to EQF Level 5 descriptors
ESCO	Standardised job profiles and competences for EU labour market	Curriculum and assessment outcomes use ESCO terminology and structure

6.3 Quality Assurance for ESE Professional Profile development and implementation

Quality assurance (QA) in the SUSTAIN-EU assessment system ensures that the certification process is credible, fair, transparent, and continuously improving. It builds trust among learners, employers, and educational institutions across Europe. The QA framework is based on three pillars:

1) Alignment with EQAVET

The European Quality Assurance in Vocational Education and Training (EQAVET) framework provides a structured approach to quality assurance through a continuous improvement cycle:

Planning → Implementation → Evaluation → Review

This cycle is applied to all stages of assessment design and delivery, ensuring that processes are systematic and evidence based.

Key EQAVET principles relevant to SUSTAIN-EU:

- Descriptors and Indicators: Used to monitor assessment of quality at both system and provider levels.
- Transparency and Comparability: Supports mutual trust and recognition of qualifications across Europe.

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- Digital Readiness: EQAVET emphasises adapting QA processes for online and self-directed learning environments.

2) Internal and External Peer Review

Peer review is a cornerstone of quality assurance in assessment design and implementation. It ensures validity, reliability, and fairness by incorporating diverse perspectives.

- Internal Peer Review:

  Conducted by project partners from different countries and backgrounds. Focuses on clarity, alignment with learning outcomes, and cultural relevance.

- External Peer Review:

  Involves independent experts in sustainability, VET, and assessment. Provides objective feedback on assessment validity and relevance to professional standards.

Best practices for peer review:

- Structured rubrics and clear criteria
- Multiple iterations for feedback and improvement.
- Ensure anonymity and transparency where appropriate (used on external peer review).

3) Continuous Improvement

Continuous improvement ensures that assessment practices evolve based on evidence and feedback. This involves:

- Data Analysis: Monitoring learner performance, completion rates, and satisfaction.
- Feedback Loops: Collecting input from learners, tutors, and reviewers after each cycle is highly recommended.
- Iterative Updates: In the future, revise assessment tools to reflect new sustainability trends and technological advances.

Suggested frameworks and models for continuous improvement:

- Deming Cycle (Plan-Do-Check-Act): Embedded in EQAVET for iterative quality enhancement.

Kirkpatrick's Four Levels: Used for evaluating learning effectiveness in e-learning contexts.

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4) Documentation and Version Control

Transparency in QA requires clear documentation and version control for all assessment-related materials. This ensures traceability and accountability throughout the project lifecycle.

Best practices:

- **Version control systems** (e.g., SharePoint, email exchange) to track changes.
- Maintain track of revisions, approvals, and peer review comments.
- Label documents with **WP and Task identifiers** for clarity.

Summary Table: QA Components for ESE professional profile course development and implementation

Component	Key Actions
EQAVET Alignment	Apply quality cycle (Plan-Do-Check-Act)
Peer Review	Internal + external, structured rubrics
Continuous Improvement	Data-driven updates, feedback loops
Documentation	Version control, transparency

6.4 Assessment Design

The SUSTAIN-EU assessment design is structured to ensure that each Competence Unit's (CU) assessment tasks are directly and transparently linked to its defined Learning Outcomes (LOs) – WP2 Task 2. This approach is detailed in the project's WP2 documentation, which outlines the process and responsibilities for developing, reviewing, and finalising the assessment framework.

Each assessment task is explicitly designed to measure the achievement of the specific LOs for the corresponding CU. These LOs are articulated in terms of knowledge, skills, and autonomy & responsibility, in line with EQF Level 5 and ESCO standards.

As described in WP2, partners use standardised templates to prepare the LOs, CU descriptions, contact hours, workload, and external resources. This ensures consistency and clarity across all CUs and their assessments.

The assessment design process involves multiple stages:

- Initial drafting of LOs and assessment tasks by designated partners.

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- Peer review and feedback from all consortium members to ensure alignment, clarity, and relevance.
- Final harmonisation and proofreading before translation and publication.

Assessment tasks are selected to best reflect the nature of the competence being assessed. These may include:

1) Online quizzes for factual knowledge

Online quizzes are used to assess learners' recall and understanding of key facts, concepts, definitions, and principles. They are typically composed of multiple-choice, true/false, or short-answer questions and are automatically graded by the e-learning platform.

For self-directed training, quizzes are automatically graded by the platform. Learners receive instant feedback, explanations for correct/incorrect answers, and can often retake quizzes within set limits. Learners can attempt quizzes at their own pace, review feedback, and use automated hints or AI chatbot support if they get stuck.

2) Case studies and scenario-based tasks for applied skills

Case studies and scenario-based tasks present learners with realistic situations or problems. Learners must analyse, interpret, and apply their knowledge to propose solutions or make decisions, demonstrating their ability to transfer learning to practical contexts.

For self-directed training, learners are presented with realistic scenarios and must select or construct responses. Automated grading is possible via multiple-choice, branching scenarios, or structured short answers with model solutions. The platform provides instant feedback, model answers, and explanations. For open-ended responses, AI can provide formative feedback or self-assessment checklists.

3) Project-based assignments for integration and synthesis

Project-based assignments require learners to integrate knowledge and skills from across the CU (or multiple CUs) to produce a substantial output, such as a sustainability plan, audit report, or data analysis. These assignments assess higher-order thinking, synthesis, and the ability to manage complex tasks.

For self-directed training, learners complete structured projects (e.g., sustainability plans, data analyses) using templates. Submission is via the platform. Automated rubrics are used for grading. Learners receive detailed feedback based on rubric criteria. AI can offer suggestions for improvement or flag missing elements. For complex tasks, learners may compare their work to anonymised model answers.

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4) Reflective journals or self-assessment for autonomy and responsibility

Reflective journals and self-assessment tasks encourage learners to critically reflect on their learning process, decision-making, and professional behaviour. These tasks assess autonomy, responsibility, and the ability to self-evaluate and improve.

For self-directed training, learners write reflections or complete self-assessment checklists. The platform prompts critical thinking with guiding questions. AI or automated tools provide feedback on completeness, depth, and alignment with learning outcomes. Learners may be prompted to revisit reflections after completing other tasks.

5) Peer review where appropriate, even in a self-learning context

Peer review tasks involve learners evaluating and providing feedback on each other's work. This fosters critical thinking, collaboration, and the ability to assess quality against set criteria. In a self-learning context, peer review can be facilitated through platform tools or AI-supported feedback.

For self-directed training, peer review can be facilitated by the platform, if possible. Learners anonymously review each other's work using structured rubrics. The platform matches submissions for review, provides clear rubrics, and aggregates peer feedback. If peer review is not feasible (e.g., low enrolment), AI-generated feedback or self-assessment against model answers can substitute.

Example in detail:

CU1: Introduction to Business Sustainability

- Online Quiz: 40%
  Covers key concepts, definitions, and EU sustainability policies.

- Case Study/Scenario: 20%
  Analyse a short scenario about a company's sustainability challenge.

- Project-Based Assignment: 20%
  Create a basic sustainability SWOT analysis for a small business.

- Reflective Journal/Self-Assessment: 10%
  Reflect on your own understanding of sustainability and its relevance to your context.

- Peer Review: 10%
  Review a peer's SWOT analysis and provide feedback.

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CU2: Sustainability Science

- Online Quiz: 40%
  Test on climate science, resource cycles, and environmental impact.
- Case Study/Scenario: 20%
  Analyse a scenario about biodiversity loss or resource depletion.
- Project-Based Assignment: 20%
  Prepare a short report on a local environmental issue using scientific data.
- Reflective Journal/Self-Assessment: 10%
  Reflect on the role of science in sustainability decision-making.
- Peer Review: 10%
  Review a peer's environmental issue report.

CU3: Ways of Thinking (Design, Futures, Circular, Systems)

- Online Quiz: 10%
  Quiz on systems thinking, circular economy, and design principles.
- Case Study/Scenario: 40%
  Scenario: Apply systems thinking to a waste management problem.
- Project-Based Assignment: 20%
  Develop a conceptual map or model for a circular business process.
- Reflective Journal/Self-Assessment: 10%
  Reflect on your approach to problem-solving using these frameworks.
- Peer Review: 10%
  Review a peer's conceptual map/model.

CU4: Data Collection & Management

- Online Quiz: 40%
  Quiz on data types, collection methods, and data quality.
- Case Study/Scenario: 20%
  Scenario: Identify data gaps in a sustainability report.

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- Project-Based Assignment: 20%
  Upload and analyse a sample dataset (e.g., energy use, waste data).

- Reflective Journal/Self-Assessment: 10%
  Reflect on challenges in data collection and management.

- Peer Review: 10%
  Review a peer's data analysis and provide suggestions.

CU5: Sustainability Plan Development & Implementation

- Online Quiz: 40%
  Quiz on steps and components of a sustainability plan.

- Case Study/Scenario: 20%
  Scenario: Evaluate a failed sustainability initiative and suggest improvements.

- Project-Based Assignment: 20%
  Develop a full sustainability plan for a hypothetical or real organisation.

- Reflective Journal/Self-Assessment: 10%
  Reflect on your decision-making process during plan development.

- Peer Review: 10%
  Review a peer's sustainability plan and provide constructive feedback.

CU6: Sustainable Finance and Operations

- Online Quiz: 40%
  Quiz on sustainable finance concepts, ESG, and green operations.

- Case Study/Scenario: 20%
  Analyse a company's financial report for sustainability risks and opportunities.

- Project-Based Assignment: 20%
  Design a simple budget for a green project.

- Reflective Journal/Self-Assessment: 10%
  Reflect on the challenges of integrating sustainability into finance.

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- Peer Review: 10%
  Review a peer's green project budget.

CU7: Carbon Accounting & Reporting

- Online Quiz: 40%
  Quiz on carbon accounting standards and reporting frameworks.
- Case Study/Scenario: 20%
  Scenario: Calculate the carbon footprint of a small business operation.
- Project-Based Assignment: 20%
  Prepare a carbon report using the provided data and spreadsheet tools.
- Reflective Journal/Self-Assessment: 10%
  Reflect on the importance and limitations of carbon reporting.
- Peer Review: 10%
  Review a peer's carbon report.

CU8: Change Management & Trans disciplinarity

- Online Quiz: 40%
  Quiz on change management models and stakeholder engagement.
- Case Study/Scenario: 20%
  Scenario: Plan a change initiative in a resistant organisation.
- Project-Based Assignment: 20%
  Develop a stakeholder engagement plan for a sustainability project.
- Reflective Journal/Self-Assessment: 10%
  Reflect on your approach to leading change and working across disciplines.
- Peer Review: 10%
  Review a peer's engagement plan.

CU9: Environmental Legislation & ESG Reporting & Auditing

- Online Quiz: 40%
  Quiz on key EU environmental laws and ESG standards.

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- Case Study/Scenario: 20%
  Scenario: Assess compliance risks in a company's operations.

- Project-Based Assignment: 20%
  Prepare an ESG audit checklist and apply it to a case study.

- Reflective Journal/Self-Assessment: 10%
  Reflect on the role of legislation in driving sustainability.

- Peer Review: 10%
  Review a peer's ESG audit checklist.

The actual ponderance for each CU should be determined based on the specific learning outcomes and the importance of each competence domain. For some CUs, project-based work may be central; for others, knowledge checks or reflection may be more prominent.

The ponderance (weighting) can be adjusted by the partnership based on the importance of each assessment type for the CU's learning outcomes. Peer review may be supported by automated or AI-guided feedback in the self-learning context.

If the training is 100% self-directed, the assessment must ensure that all evaluation is automated, transparent, and supportive of independent learning. The assessment system relies on automation, clear rubrics, instant feedback, and AI support. Peer review can be included if the platform supports it or replaces it with AI/self-assessment if not. The ponderance for each assessment type should reflect the importance of each competence in the CU's learning outcomes.

If the platform or learning context does not allow the implementation of multiple assessment types (such as project assignments, case studies, peer review, or reflective journals), the evaluation system will rely exclusively on automated quizzes. In this scenario, quizzes will account for 100% of the final grade for the respective Competence Unit (CU). These quizzes will be carefully designed to assess not only factual knowledge but also conceptual understanding and basic application of key sustainability concepts through scenario-based and problem-solving questions. To support learning, each quiz will include instant feedback, explanations for correct and incorrect answers, and the possibility of retaking the quiz, ensuring that learners can review the material, improve their understanding, and progressively achieve the required level of competence.

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Additional Self-Directed Features

- **Automated Feedback:**
  All assessment types provide **instant, actionable feedback** to support independent learning.
- For **quizzes**, learners receive:
  - ✓ Immediate indication of correct/incorrect answers.
  - ✓ Explanations for each question to reinforce understanding.
- For **written tasks** (projects, reflections):
  - ✓ AI-driven feedback highlights strengths and areas for improvement.
  - ✓ Suggestions for resources or examples to guide revisions.
- **Retake Policy:**
  Learners can **retake quizzes** per Competence Unit (CU).
- After each attempt:
  - ✓ Automated feedback identifies incorrect responses and explains why.
  - ✓ AI chatbot offers hints and directs learners to relevant learning materials.
- For **assignments**:
  - ✓ Resubmissions are allowed within platform rules (e.g., two resubmissions per CU).
  - ✓ Each resubmission must address feedback provided in the previous attempt.
- **Progress Tracking:**
- The platform provides a **visual dashboard** showing:
  - ✓ Completed CUs and earned micro-credentials (digital badges).
  - ✓ Scores for each assessment type.
  - ✓ Competence domains mastered (Knowledge, Skills, Autonomy & Responsibility).
- Learners can monitor their progress toward the **full SUSTAIN-EU Digital Certificate.**

Support

- An integrated AI tutor/chatbot is available 24/7 to:

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- ✓ Clarify instructions and assessment criteria.
- ✓ Provide hints for quizzes and guidance for project tasks.
- ✓ Offer motivational prompts and time management tips.

- The chatbot also assists with technical issues and directs learners to FAQs or help resources.

6.4.1 Criteria and Minimum Scores

- **Performance Criteria:** Clearly defined for each assessment, based on the Competence Matrix.
- **Minimum Passing Scores:**
  - Each CU: e.g., 60% minimum
  - All CUs must pass for the full certificate.
  - Micro-credentials: Passing a CU grants a digital badge.
- **Retake Policy:** Up to 2 retakes per CU, with automated feedback and AI tutor guidance.

6.4.2 Assessment Delivery and Integrity

- **Platform:** 100% online, self-directed, with automated and/or AI-supported grading.
- **Authenticity:** Randomisation, time limits, plagiarism checks.
- **Support:** AI Tutor Bot for guidance and clear instructions

6.5 Certification Process

The certification process in SUSTAIN-EU ensures that learners receive **transparent, verifiable, and portable credentials** aligned with European frameworks for vocational education and training. It consists of three main components.

1. Awarding the Certificate

Upon successful completion of all nine Competence Units (CUs), learners are awarded the SUSTAIN-EU Digital Certificate.

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The certificate includes:

- ✓ Reference to EQF Level 5, confirming the learner's competence level.
- ✓ ECVET credit points (approx. 5 credits for the full program, based on 200 learning hours).
- ✓ A competence matrix summary, showing achieved Learning Outcomes across Knowledge, Skills, and Autonomy & Responsibility.

Certificates are issued digitally and can be verified by employers and institutions through the SUSTAIN-EU platform.

European Alignment:

- EQF ensures comparability of qualifications across Europe.
- ECVET provides transparency in credit allocation for mobility and lifelong learning.
- (CEDEFOP, 2023; European Commission, 2017)

2. Issuance of Micro-Credentials (Digital Badges)

- Each CU completed successfully grants a digital badge as a micro-credential.
- Badges include:
  - ✓ CU title and description.
  - ✓ Linked Learning Outcomes and competence domains.
  - ✓ EQF Level 5 reference and ECVET points.

Badges are automatically issued upon passing the CU assessment and can be shared on professional platforms (e.g., LinkedIn).

Stacking Model:

Accumulating all nine badges leads to the full SUSTAIN-EU Digital Certificate.

(European Commission, 2022; CEDEFOP, 2023)

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3. Record-Keeping and Verification

- All credentials are stored in a secure digital repository with:
  - ✓ Blockchain or encrypted verification for authenticity.
  - ✓ Access for employers and VET providers to validate learner achievements.
- Learners have a personal dashboard to download certificates, view badges, and share credentials.

6.5.1 Micro-Credentials and Stacked Certification

The SUSTAIN-EU certification model adopts a modular approach to credentialing, enabling learners to earn recognition for individual competences while progressing toward full certification as a European Sustainability Expert (ESE). This approach supports lifelong learning, mobility, and transparency, in line with European strategies for vocational education and training.

Micro-Credentials: Digital Badges for Each CU

- Each **Competence Unit (CU)** completed successfully grants a **digital badge**.
- Badges include:
  - CU title and description.
  - Linked Learning Outcomes (Knowledge, Skills, Autonomy & Responsibility).
  - **EQF Level 5 reference** and **ECVET credit points** (approx. 0.5–0.6 per CU).
- Badges are **automatically issued** upon passing the CU assessment and can be shared on professional platforms (e.g., LinkedIn).
- Metadata ensures **portability and verification**, including issuer details, date, and competence mapping.

Stacking: Pathway to Full Certification

- Accumulating **all nine CU badges** leads to the **SUSTAIN-EU Digital Certificate**, which:
  - Confirms mastery of the complete ESE competence framework.
  - References **EQF Level 5** and **ECVET credits** (approx. 5 credits for the full program).

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  - Is recognised across Europe as a professional qualification aligned with ESCO profiles for sustainability managers.
- Learners can complete CUs in any order, supporting **flexibility and progressive upskilling**.

Recognition and Transparency

- **Alignment with ECVET:** Each CU is assigned credit points based on workload (approx. 8–12 hours per CU), ensuring comparability and transferability.
- **Recognition by Employers and VET Providers:** Micro-credentials and the full certificate are designed to meet ESCO competence descriptors for sustainability-related roles.
- **Digital Verification:** Credentials are stored securely and can be verified by employers and institutions through the SUSTAIN-EU platform.

This modular, stackable approach reflects **European Commission recommendations on micro-credentials** (2022) and CEDEFOP guidelines for learning outcomes and transparency. It empowers learners to **build competences progressively**, while ensuring **quality and recognition** across the EU.

6.6 Inclusivity & Accessibility

The training programme is designed following Universal Design for Learning (UDL) principles and complies with the WCAG 2.2 accessibility guidelines, ensuring that all learners can access and participate in the course regardless of their abilities or learning needs. Learning materials and assessments are provided in multiple formats (e.g., text, visual, and interactive content), and flexible time allowances are applied where appropriate to support different learning paces. The platform is compatible with assistive technologies such as screen readers and alternative navigation tools. In addition, an AI chatbot is available to guide learners, clarify instructions, and provide support throughout the learning process, helping to ensure an inclusive and accessible learning experience for all participants.

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- Universal Design and WCAG 2.2 compliance - https://www.w3.org/TR/WCAG22/
- Multiple formats, time allowances, assistive tech, and AI chatbot support for guidance.

6.7 Conclusion

The SUSTAIN-EU Summative Assessment Overview establishes a robust, transparent, and future-oriented framework for certifying European Sustainability Experts (ESE). By grounding assessment in competence-based, learning outcomes-oriented principles and aligning with the European Qualifications Framework (EQF), ESCO, and ECVET, the project ensures that certification is both credible and portable across Europe.

The integration of quality assurance mechanisms—through EQAVET alignment, rigorous peer review, and continuous improvement—guarantees that assessment processes remain fair, valid, and responsive to evolving professional and societal needs. The modular structure, with micro-credentials and a stackable pathway to full certification, empowers learners to progress flexibly and gain recognition for their achievements at every stage.

Inclusivity and accessibility are embedded throughout, ensuring that all learners, regardless of background or ability, can demonstrate their competences in a supportive, fully self-directed digital environment. Automated feedback, clear retake policies, and AI-driven support tools further enhance the learner experience and uphold the integrity of the assessment process.

Ultimately, the SUSTAIN-EU assessment system not only certifies expertise but also fosters a culture of lifelong learning, professional mobility, and excellence in sustainability practice. It stands as a model for innovative, quality-assured certification in the European vocational education and training landscape, supporting both individual career development and the broader transition to a sustainable future.

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