GLOBE STEAMSS Competency Framework

Work Package 2
Research Study on Global Learning Practices in Higher Education

Activity A2.2 Developing the GLOBE-STEAMSS Competency Framework and Development of Learning Paths.

ABSTRACT

This document presents, summarises and explains the **GLOBE-STEAMSS Competency Framework**, developed within an **Erasmus+ project** focused on improving **green, sustainability, digital, and entrepreneurial learning** in **STEAM and Social Sciences higher** education. This version is the one sent to stakeholders who, after review it, will provide feedback on their opinion and possible use

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RESPONSABLE PARTNER: UPM

REVIEWER: FUDS

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Global Learning Opportunities for Green and Sustainability Education in STEAM and Social Sciences Degrees
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Table of Contents

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Overview

This document presents a comprehensive, multi-layered resource that translates three major EU competence frameworks into operationalized, context-specific, and practically applicable global competencies descriptions. The aim is to identify a set of transversal competencias aplied to STEAM and Social Sciences (SS) education:

- to better prepare students for the complexities of the modern world
- addressing social and environmental challenges.

The framework consolidates the results of competency selection across three major EU competence frameworks, DigComp 2.2, EntreComp, and GreenComp, resulting from a collaborative effort by the partnership in the GLOBE-STEAMSS Erasmus+ project.

GLOBE-STEAMSS project serves as the foundation for developing learning paths to be developed within the project's certified micro-credential training modules for target groups, assessment tools, and institutional implementation strategies across the partnership institutions and beyond.

1. Structure

This framework is organized in 3 dimensions:

Dimension 1: EU Frameworks
Following the overview, the document includes, in a first dimension, visual diagrams representing the structure extracted from each EU framework:

- DigComp: A timeline-style conceptual model showing the 5 areas and their interconnections
- EntreComp: A circular diagram depicting the three main areas (Ideas & Opportunities, Resources, Into Action) and their sub-competencies
- GreenComp: A hierarchical rectangle diagram showing the four main competence areas and twelve individual competencies

These visuals help readers understand the conceptual landscape before diving into detailed competency descriptions.

Dimension 2: Detailed Competency Descriptions
For each selected competency, the document provides a structured template with the following components:

A. Competency Definition
- Official definition from the EU framework (as stated in official documents)
- Partners interested: It lists which of the five partner institutions selected this competency

B. Target Groups Justification Table
A comprehensive table showing the specific relevance of the competency for six target groups:

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1. STEAMSS Students (Undergraduate & Graduate)
2. Educators and Academic Staff
3. Students in Career Transitions
4. HEIs Offering STEAMSS Degrees
5. Curriculum Developers in STEAMSS
6. Industry Professionals

Each cell in this table contains (see Figure 1):
- Justification statement, explaining why the competency is important for that target group.
- Partner abbreviation (UPM, SASS, UPB, RI and UCLL) indicating which partner provided the justification.

DigComp – Area 1: Information and Data Literacy

1.1 Browsing, searching, and filtering information :

To articulate information needs, to search for data, information and content in digital environments, to access them and to navigate between them. To create and update personal search strategies.

Partners interested in:
UPM

DigComp Competence	Target Groups with Specific Justification
Information and Data Literacy 1.1 Browsing, searching, and filtering information	• **STEAMSS Students**: ○ Effective digital search is foundational for research, learning, and self-directed problem solving. It empowers students to access and critically select relevant academic papers, resources, and datasets, fostering academic independence and lifelong learning. (UPM)
	• **Educators and Academic Staff:** ○ Enables faculty to find, curate, and share accurate teaching materials and recent scientific advancements, improving teaching quality and innovation. (UPM)
	• **Students in Career Transitions:** ○ Reduces entry barriers to new knowledge domains. (UPM)
	• **HEIs Offering STEAMSS Degrees** ○ Essential for lifelong learning, employability, and talent development. (UPM)
	• **Curriculum Developers** ○ Essential for designing modules that build digital literacy and analytical skills, forming the backbone of curriculum modernization. (UPM)
	• **Industry Professionals:** ○ Critical for project work, technical troubleshooting, and staying current with new tools, methodologies, and trends. (UPM)

Figure 1. Example Dimension 2

Dimension 3: Learning Outcomes Examples:

For each competency, examples of learning outcomes are provided from different partner institutions:

Each example includes (see Figure 2):

- Dimensions: (Knowledge, Skills, Responsibility/Autonomy) | Three-part breakdown following EQF guidelines.
- Learning Outcome: Formulated statement of what learners will achieve (following Cedefop recommendations).
- Associated Curricula/Course: Which specific program, framework or course addresses this learning outcome in the academic context of that partner.
- Proficiency Level: on a scale, Foundation / Intermediate / Advanced, indicating suggested level.

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Example of UPM

Dimensions	Description	
Knowledge	Understand different digital sources, search engines, and filtering methods	
Skills	Apply effective search strategies including keywords and filters to locate relevant information	
Responsibility and Autonomy	Independently manage, refine, and adapt search for academic and professional tasks	
Learning Outcome		
Given access to digital databases and search tools, the learner will effectively select and apply appropriate search strategies to retrieve relevant and accurate digital information		
Curricula/Course associated		
Computing Curricula 2020		
Proficiency level		
Foundation	**Intermediate**	Advanced

Figure 2. Example Dimension 3

2. Key Structural Features Across All Sections

A. Multi-Partner Perspective

Every competency description includes multiple partner contributions, marked with partner abbreviations:

- UPM: Universidad Politécnica de Madrid (Spain)
- UPB: Universitatea Politehnica Bucureşti (Romania)
- UCLL: UC Leuven-Limburg (Belgium)
- RI: Renaissance Institute (Turkey)
- SASS: School of Applied Social Sciences (Slovenia)

This creates a rich, culturally diverse perspective on how each competency is understood and applied across Europe.

B. Three Analytical Layers

1. EU Framework Layer: Official definitions from DigComp 2.2, EntreComp, or GreenComp documents
2. Institutional Analysis Layer: Each partner's analysis of how competencies are addressed in their curricula
3. Learning Outcomes Layer: Translated into concrete, measurable learning statements

C. Accessibility & Justification

Every element includes clear justification narratives explaining:

- Why the competency matters
- For whom it is important
- How it connects to curricula and practice
- At what level learners should achieve it in different contexts

3. Document Circulation and Use

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The document serves multiple purposes. Among others:

- Framework Development: Project coordinators and consortium partners
- Curriculum Mapping: HEI curriculum developers and educators.
- Stakeholder Reference: Industry professionals, employers, policy makers,…
- Competency Assessment: Students, trainees, educational institutions.
- Learning Path Design: The basis for developing subsequent GLOBE-STEAMSS learning paths and digital tools.

This framework document is distinctive because it:

1. Integrates three EU competence frameworks in a single, coherent document
2. Captures multi-institutional expertise from five diverse European contexts
3. Provides concrete learning outcomes formulated according to Cedefop standards
4. Grounds competencies in curricula and practice rather than remaining purely theoretical
5. Emphasizes target-group relevance with detailed justifications for diverse audiences
6. Offers proficiency guidance indicating appropriate learning levels
7. Supports curriculum design by providing practical templates and examples
8. Ensures European coherence while respecting institutional and national diversity

4. Summary of Coverage

DigComp 2.2

- 5 Areas: (Information and Data Literacy, Communication & Collaboration, Digital Content Creation, Safety, Problem Solving)
- 13 Total Competencies mapped across the framework selected by partners:

1. Browsing/searching (Proposed by 1 parter out of 5)
2. Evaluating information (4 out of 5)
3. Managing data (1 out of 5)
4. Interacting digitally (1 out of 5)
5. Collaborating (2 out of 5)
6. Netiquette (1 out of 5)
7. Developing digital content (3 out of 5)
8. Integrating and re-elaborating digital content (1 out of 5)
9. Protecting personal personal data and Privacy (4 out of 5)
10. Protecting health & well-being (1 out of 5)
11. Solving technical problems (1 out of 5)
12. Identifying needs and technological responses (1 out of 5)
13. Creatively using digital technologies (4 out of 5)

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DIGCOMP AREA	Code	Competency	UCLL	UPB	RI	SASS	UPM
Information and data literacy	1.1	Browsing, searching and filtering data/information					
	1.2	Evaluating data, information and digital content					
	1.3	Managing data, information and digital content					
Communication and collaboration	2.1	Interacting through digital technologies					
	2.2	Sharing through digital technologies					
	2.3	Engaging in citizenship through digital technologies					
	2.4	Collaborating through digital technologies					
	2.5	Netiquette					
	2.6	Managing digital identity					
Digital content creation	3.1	Developing digital content					
	3.2	Integrating and re-elaborating digital content					
	3.3	Copyright and licenses					
	3.4	Programming					
Safety	4.1	Protecting devices					
	4.2	Protecting personal data and privacy					
	4.3	Protecting health and well-being					
	4.4	Protecting the environment					
Problem solving	5.1	Solving technical problems					
	5.2	Identifying needs and technological responses					
	5.3	Creatively using digital technologies					
	5.4	Identifying digital competence gaps					

EntreComp

- 3 Areas: (Ideas & Opportunities, Resources, Into Action)
- 11 Total Competencies across the framework selected by partners:

1. Spotting opportunities (3 out of 5)
2. Creativity (5 out of 5)
3. Valuing ideas (1 out of 5)
4. Ethical and sustainable thinking (3 out of 5)
5. Motivation & perseverance (2 out of 5)
6. Mobilizing resources (3 out of 5)
7. Financial and economic literacy (1 out of 5)
8. Mobilizing others (1 out of 5)
9. Planning and Management (1 out of 5)
10. Copying with uncertainty, ambiguity and risk (2 out of 5)
11. Working with others (3 out of 5)

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Area	Code	Competency	UCLL	UPB	RI	SASS	UPM
Ideas and Opportunities	1.1	Spotting opportunities					
	1.2	Creativity					
	1.3	Vision					
	1.4	Valuing ideas					
	1.5	Ethical and sustainable thinking					
Resources	2.1	Self-awareness and self-efficacy					
	2.2	Motivation and perseverance					
	2.3	Mobilizing resources					
	2.4	Financial and economic literacy					
	2.5	Mobilizing others					
Into Action	3.1	Taking initiative					
	3.2	Planning and management					
	3.3	Coping with uncertainty, ambiguity and risk					
	3.4	Working with others					
	3.5	Learning through experience					

GreenComp

- 4 Areas: (Embodying Sustainability Values, Embracing Complexity, Envisioning Sustainable Futures, Acting for Sustainability)
- 9 Total Competencies across the framework selected by partners:

1. Supporting fairness (3 out of 5)
2. Systems thinking (3 out of 5)
3. Critical thinking (1 out of 5)
4. Problem framing (1 out of 5)
5. Futures literacy (1 out of 5)
6. Adaptability (3 out of 5)
7. Exploratory thinking (3 out of 5)
8. Collective action (5 out of 5)
9. Individual initiative (5 out of 5)

Area	Code	Competency	UCLL	UPB	RI	SASS	UPM
Embodying Sustainability Values	1.1	Valuing sustainability					
	1.2	Supporting fairness					
	1.3	Promoting nature					
Embracing Complexity in Sustainability	2.1	Systems thinking					
	2.2	Critical thinking					
	2.3	Problem framing					
Envisioning Sustainable Futures	3.1	Futures literacy					
	3.2	Adaptability					
	3.3	Exploratory thinking					
Acting for Sustainability	4.1	Political agency					
	4.2	Collective action					
	4.3	Individual initiative					

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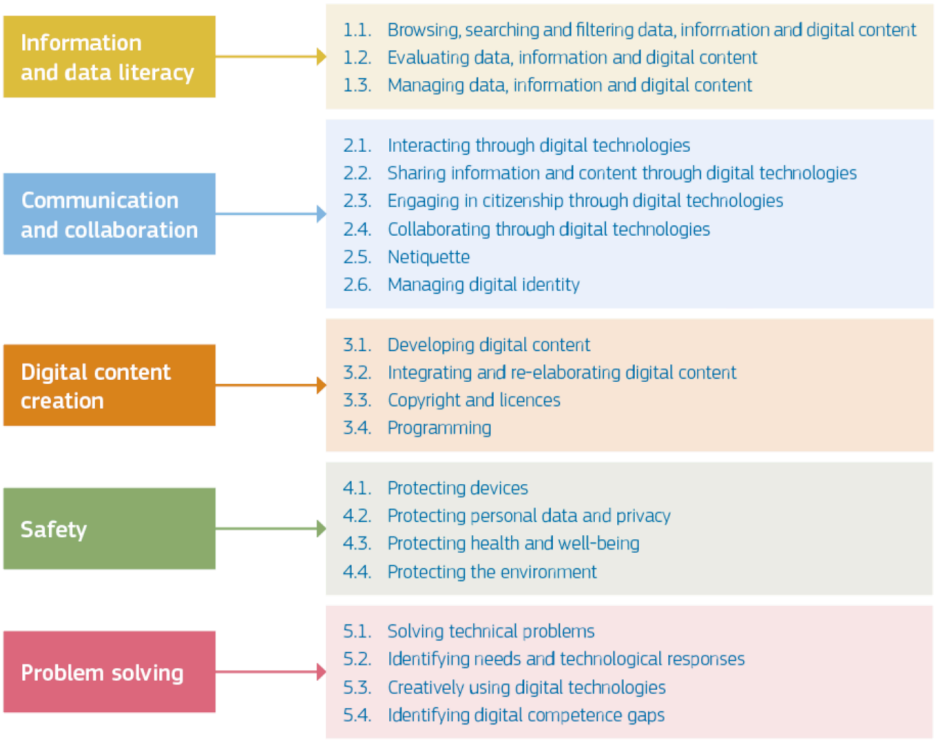
Description of competencies

1. From DIGCOMP 2.2



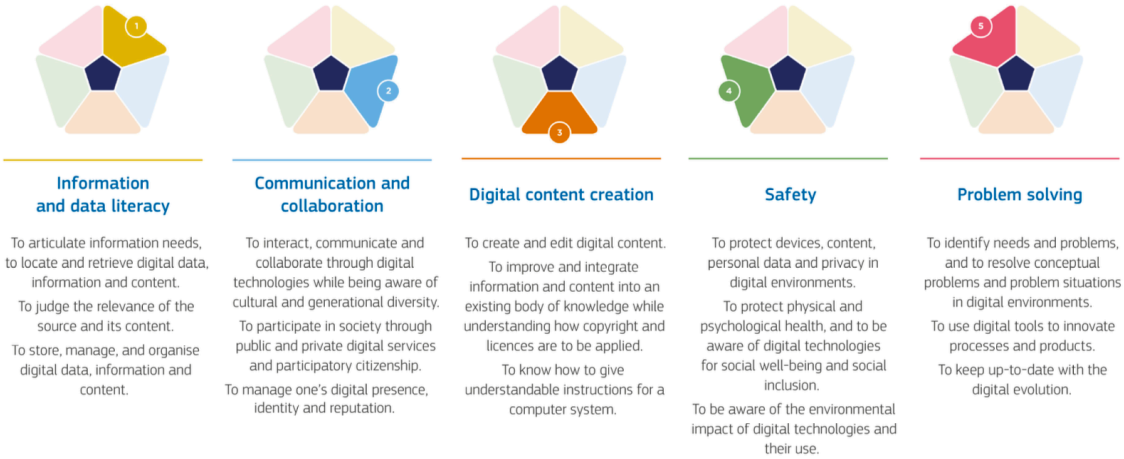


Figure 3. The DigComp conceptual reference model

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DigComp – Area 1: Information and Data Literacy

1.1 Browsing, searching, and filtering information :

To articulate information needs, to search for data, information and content in digital environments, to access them and to navigate between them. To create and update personal search strategies.

Partners interested in:
UPM

DigComp Competence	Target Groups with Specific Justification
Information and Data Literacy 1.1 Browsing, searching, and filtering information	• **STEAMSS Students**: ○ Effective digital search is foundational for research, learning, and self-directed problem solving. It empowers students to access and critically select relevant academic papers, resources, and datasets, fostering academic independence and lifelong learning. (UPM)
	• **Educators and Academic Staff:** ○ Enables faculty to find, curate, and share accurate teaching materials and recent scientific advancements, improving teaching quality and innovation. (UPM)
	• **Students in Career Transitions:** ○ Reduces entry barriers to new knowledge domains. (UPM)
	• **HEIs Offering STEAMSS Degrees** ○ Essential for lifelong learning, employability, and talent development. (UPM)
	• **Curriculum Developers** ○ Essential for designing modules that build digital literacy and analytical skills, forming the backbone of curriculum modernization. (UPM)
	• **Industry Professionals:** ○ Critical for project work, technical troubleshooting, and staying current with new tools, methodologies, and trends. (UPM)

Examples of Learning Outcomes:

Example of UPM

Dimensions	Description
Knowledge	Understand different digital sources, search engines, and filtering methods
Skills	Apply effective search strategies including keywords and filters to locate relevant information
Responsibility and Autonomy	Independently manage, refine, and adapt search for academic and professional tasks
Learning Outcome	

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Given access to digital databases and search tools, the learner will effectively select and apply appropriate search strategies to retrieve relevant and accurate digital information		
Curricula/Course associated		
Computing Curricula 2020		
Proficiency level		
Foundation	**Intermediate**	Advanced

1.2 Evaluating data, information and digital content:

To analyse, compare and critically evaluate the credibility and reliability of sources of data, information and digital content. To analyse, interpret and critically evaluate the data, information and digital content.

Partners interested in:
SASS, UPM, UCL, RI

DigComp Competence	Target Groups with Specific Justification
Information and Data Literacy 1.2 Evaluating data, information and digital content	• **STEAMSS Students**: ○ Develops critical thinking and combats misinformation, essential for research and evidence-based work (SASS) ○ Ensures academic integrity, source trustworthiness, and high-quality outcomes. (UPM) ○ Builds capacity to search, evaluate, and interpret information critically. (UCL) ○ To critically assess the validity of sustainability data and avoid "greenwashing" claims. (RI)
	• **Educators and Academic Staff:** ○ Equips teachers to teach students how to critically evaluate sources, reducing misinformation. (SASS) ○ Ensures teaching of critical thinking and evaluative skills, which boosts student outcomes and minimizes classroom bias. (UPM) ○ Strengthens evidence-based teaching and digital research competencies. (UCL) ○ To curate reliable, accurate, and high-quality digital resources for their courses. (RI)
	• **Students in Career Transitions:** ○ As digital misinformation becomes widespread, critical evaluation is vital for forming sound scientific judgments, safeguarding from errors, and making evidence-based decisions. (UPM) ○ Builds digital trust and literacy crucial for data- Develops analytical and problem-solving abilities for data-informed work. (UCL) ○ To sift through online career resources and identify legitimate, high-quality training opportunities. (RI)
	• **HEIs Offering STEAMSS Degrees**

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	○ Necessary for embedding robust assessment of digital literacy and source validation within programs. (UPM) ○ Supports data-driven decisión making and quality assurance processes. (UCL) ○ To use data to evaluate its own sustainability performance and make evidence-based decisions. (RI)
	• **Curriculum Developers** ○ Necessary for embedding robust assessment of digital literacy and source validation within programs. (UPM) ○ Promotes integration of information literacy across disciplines and program outcomes. (UCL) ○ To base curriculum decisions on verified data and educational best practices. (RI)
	• **Industry Professionals:** ○ Supports quality control, risk mitigation, and reliable knowledge transfer in workplaces where accurate data is indispensable. (UPM) ○ Enhances ability to make informed decisions using reliable data sources. (UCL) ○ To perform due diligence on sustainable suppliers and critically evaluate data from sustainability reports. (RI)

Examples of Learning Outcomes:

Example of SASS

Dimensions	**Description**	
Knowledge	Knowledge of criteria for evaluating information sources (e.g. bias, authority).	
Skills	Ability to use search engines, filters, and criteria to assess digital content effectively.	
Responsibility and Autonomy	Ability to apply critical thinking independently and take responsibility for one's use of digital information.	
Learning Outcome		
Critically assess the credibility, relevance, and accuracy of digital information sources using appropriate evaluation methods.		
Curricula/Course associated		
Media and Communication		
Proficiency level		
Foundation	Intermediate	Advanced

Example of UPM

Dimensions	**Description**
Knowledge	Know criteria for credibility, relevancy, accuracy, and bias in digital content
Skills	Critically analyze and validate data and sources
Responsibility and Autonomy	Apply ethical judgement and responsibility in the assessment and use of digital content
Learning Outcome	
When presented with digital information from multiple sources, the learner will critically assess its credibility, relevance, and accuracy, explaining the rationale behind their evaluation.	

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Curricula/Course associated		
ABET		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of UCL

Dimensions	Description
Knowledge	Awareness of data sources, search strategies, and evaluation criteria for information reliability.
Skills	Ability to collect, analyse, and interpret data effectively using digital tools.
Responsibility and Autonomy	Applies information critically and responsibly, avoiding bias and misinformation.
Learning Outcome	
Evaluate, and synthesize digital information and data sources to support evidence-based reasoning and decision-making.	
Curricula/Course associated	
All STEM and Social Sciences programmes; Research Methods courses	
Proficiency level	
Foundation	Intermediate	Advanced

Example of RI

Dimensions	Description
Knowledge	Knowledge of information verification techniques, criteria for judging source credibility, and common "greenwashing" tactics.
Skills	Ability to cross-reference data, detect logical fallacies and bias, and synthesize conflicting information from multiple digital sources.
Responsibility and Autonomy	Independently applies critical skepticism to all digital content, taking personal responsibility for the accuracy and integrity of the information they use.
Learning Outcome	
Evaluate a set of online sources about a specific green technology (e.g., hydrogen fuel) and produce a synthesis report grading each source's reliability and bias.	
Curricula/Course associated	
Veri Okuryazarlığı (Data Literacy)	
Proficiency level	
Foundation	**Intermediate**	Advanced

1.3 Managing data, information and digital content:

To organise, store and retrieve data, information, and content in digital environments. To organise and process them in a structured environment.

Partners interested in:
UPB

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DigComp Competence	Target Groups with Specific Justification
Information and Data Literacy 1.3 Managing data, information and digital content	• **STEAMSS Students**: ○ Trains students to collect, interpret, and critically analyze data, which is essential for academic research and digital projects. (UPB)
	• **Educators and Academic Staff:** ○ Supports the integration of data literacy modules into courses, helping students develop evidence-based reasoning. (UPB)
	• **Students in Career Transitions:** ○ Equips them with data skills needed to adapt to digitalized workplaces, including roles in data-driven sustainability sectors. (UPB)
	• **HEIs Offering STEAMSS Degrees** ○ Strengthens institutional capacity for research, innovation, and digital transformation strategies; aligns with the SMART-EDU Digitalization of Education Strategy. (UPB)
	• **Curriculum Developers** ○ Encourages embedding of data management and literacy as transversal skills across STEAMSS programs. (UPB)
	• **Industry Professionals:** ○ Helps professionals analyze big data and apply insights in ICT, energy, and environmental industries. (UPB)

Examples of Learning Outcomes:

Example of UPB:

Dimensions	Description
Knowledge	Describes how data are collected, stored, and processed in digital systems and recognizes different data types and formats (e.g., text, image, audio, sensor data).
Skills	Collects, organizes, and presents data using basic digital tools (e.g., spreadsheets, online forms, visualization software) to support decision-making and problem-solving
Responsibility and Autonomy	Manages digital information and data responsibly and ethically by ensuring data accuracy, reliability, and transparency; selects appropriate storage solutions (e.g., local, cloud-based) to maintain security and accessibility; and promotes responsible data sharing and reuse within educational or collaborative contexts.
Learning Outcome (UPB)	
By the end of this course, students will be able to manage digital data and information responsibly by collecting, organizing, and analyzing data using appropriate digital tools, ensuring accuracy, transparency, and ethical use in educational research and practice	
Curricula/Course associated	
This learning outcome is addressed within the Educational research course, master's level)	
Proficiency level	
Foundation	**Intermediate** Advanced

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DigComp – Area 2: Communication and Collaboration

2.1 Interacting through digital technologies:

To interact through a variety of digital technologies and to understand appropriate digital communication means for a given context.

Partners interested in:
UPB

DigComp Competence	Target Groups with Specific Justification
Information and Data Literacy 2.1 Interacting through digital technologies	• **STEAMSS Students**: ○ Trains students to work effectively in digital teams, a critical skill for hybrid and remote environments. . (UPB)
	• **Educators and Academic Staff:** ○ Enables effective use of digital collaboration platforms in teaching, mentoring, research, and science communication. (UPB)
	• **Students in Career Transitions:** ○ Prepares career changers to adapt to collaborative digital workplaces. (UPB)
	• **HEIs Offering STEAMSS Degrees** ○ Strengthens institutional adoption of online collaboration tools for research and teaching; aligns with the SMART-EDU Digitalization of Education Strategy; fosters the transition to open science and supports the development of CRIS. (UPB)
	• **Curriculum Developers:** **Supports integrating group projects and digital collaboration tools into program structures.**
	• **Industry Professionals:** ○ Strengthens institutional adoption of online collaboration tools for research and teaching; aligns with the SMART-EDU Digitalization of Education Strategy; fosters the transition to open science and supports the development of CRIS. (UPB)

Examples of Learning Outcomes:

Example of UPB

Dimensions	Description
Knowledge	Describes different digital communication channels (e.g., email, messaging, videoconference, social media) and explains when each is appropriate, considering purpose, audience, and accessibility.

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Skills	Uses various digital tools (e.g., chat, video conferencing, forums, collaborative platforms) to communicate effectively and respectfully in synchronous and asynchronous environments.
Responsibility and Autonomy	Adapts communication strategies to different digital contexts, showing awareness of audience, clarity, respect, and inclusion; manages communication ethically and responsibly, maintaining professional tone and digital well-being.

Learning Outcome
By the end of this course, students will be able to communicate and collaborate effectively through appropriate digital technologies, adapting their communication strategies to diverse audiences and contexts while demonstrating professionalism, inclusion, and ethical responsibility in online interactions.
Curricula/Course associated
This learning outcome is addressed within the Teaching practicum course, master's level)
Proficiency level

Foundation	**Intermediate**	Advanced

2.4 Collaborating through digital technologies:

To use digital tools and technologies for collaborative processes, and for co-construction and co-creation of data, resources and knowledge.

Partners interested in:
UPM, RI

DigComp Competence	Target Groups with Specific Justification
Information and Data Literacy 2.4 Collaborating through digital technologies	• **STEAMSS Students**: ○ Central for group projects, labs, remote learning, and international study; helps overcome isolation, fosters networking, and improves inclusion in STEM environments. (UPM) ○ To work in international teams using tools like Miro, Slack, or GitHub, as we are in this project. (RI)
	• **Educators and Academic Staff:** ○ Strengthens team teaching, collective research, and faculty collaboration across disciplines and geographies. (UPM) ○ To participate in international research consortiums and co-create knowledge across borders. (RI)
	• **Students in Career Transitions:** ○ Central for group projects, labs, remote learning, and international study; helps overcome isolation, fosters networking, and improves inclusion in STEM environments. (UPM) ○ To network and build a professional presence on platforms like LinkedIn. (RI)
	• **HEIs Offering STEAMSS Degrees** ○ Key for developing contemporary, team-based curricula, and supports institutional digital transformation. (UPM) ○ To manage remote work and international partnerships effectively. (RI)

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- **Curriculum Developers:**
  - Key for developing contemporary, team-based curricula, and supports institutional digital transformation. (UPM)
  - To use collaborative platforms to co-design and review curricula with a diverse range of stakeholders. (RI)
- **Industry Professionals:**
  - Facilitates effective teamwork, cross-sector cooperation, and digital project management—vital in collaborative STEM workplaces. (UPM)
  - To manage distributed teams and collaborate effectively in a hybrid work environment. (RI)

Examples of Learning Outcomes:

Example of UPM

Dimensions	Description	
Knowledge	Understand digital communication platforms, collaboration norms, and digital teamwork	
Skills	Use tools to share, communicate, co-create, and manage digital collaboration projects	
Responsibility and Autonomy	Lead or participate responsibly in teams maintaining constructive and ethical behaviors	
Learning Outcome		
Using appropriate digital platforms, the learner will actively participate and contribute constructively in collaborative tasks, demonstrating awareness of and adherence to digital communication norms.		
Curricula/Course associated		
ABET		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of RI

Dimensions	Description	
Knowledge	Knowledge of digital communication tools and collaborative platforms (e.g., Teams, Slack, GitHub) suitable for international, multi-stakeholder projects.	
Skills	Ability to actively participate, share files, and co-create content (e.g., OERs) effectively in shared digital environments.	
Responsibility and Autonomy	Demonstrates an inclusive and cooperative approach to teamwork, taking autonomous responsibility for contributing to group goals.	
Learning Outcome		
As part of a remote team, use a digital collaborative platform to plan, execute, and deliver a small group project.		
Curricula/Course associated		
İşbirlikçi Proje Geliştirme (Collaborative Project Development)		
Proficiency level		
Foundation	**Intermediate**	Advanced

2.5 Netiquette:

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To be aware of behavioural norms and know-how while using digital technologies and interacting in digital environments. To adapt communication strategies to the specific audience and to be aware of cultural and generational diversity in digital environments.

Partners interested in:
SASS

DigComp Competence	Target Groups with Specific Justification
Information and Data Literacy 2.5 Netiquette	• **STEAMSS Students**: ○ Enhances ability to work in teams respectfully and share work online, building safe and inclusive classroom culture — critical for collaborative research and interdisciplinary projects. (SASS)
	• **Educators and Academic Staff:** ○ Facilitates use of digital platforms to engage students, provide feedback, and coordinate group activities. (SASS)
	• **Students in Career Transitions:**
	• **HEIs Offering STEAMSS Degrees** ○ Supports the development of blended and online learning programs that foster student participation. (SASS)
	• **Curriculum Developers**
	• **Industry Professionals:** ○ Improves remote work effectiveness and cross-departmental collaboration in digital workplaces. (SASS)

Examples of Learning Outcomes:

Example of SASS

Dimensions	Description	
Knowledge	Understanding of online communication norms, digital collaboration environments, and etiquette.	
Skills	Ability to use digital collaboration tools appropriately and to communicate respectfully in digital environments.	
Responsibility and Autonomy	Awareness of one's own behaviour online and ability to collaborate ethically and inclusively.	
Learning Outcome		
Demonstrate respectful and responsible online communication and collaboration practices while working with others on shared digital tasks.		
Curricula/Course associated		
Introduction to Computer and Information Science		
Proficiency level		
Foundation	Intermediate	Advanced

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DigComp – Area 3: Digital Content Creation

3.1 Developing digital content:

To create and edit digital content in different formats, to express oneself through digital means.

Partners interested in:
UPB, UCL, RI

DigComp Competence	Target Groups with Specific Justification
Digital Content Creation 3.1 Developing digital content	• **STEAMSS Students**: ○ Prepares students to design XR, AI-driven, and multimedia content, increasing employability in creative and technical fields. (UPB) ○ Strengthens creative communication and digital media skills for social innovation. (UCL) ○ To create "Digital Storytelling for Sustainability"—videos, blogs, or data visualizations to communicate their work. (RI)
	• **Educators and Academic Staff:** ○ Provides tools for producing engaging digital teaching content and simulations. (UPB) ○ Encourages use of multimedia tools for teaching, reflection, and public engagement. (UCL) ○ To create their own OERs (Open Educational Resources), such as lecture videos or interactive modules. (RI)
	• **Students in Career Transitions:** ○ Supports reskilling in fields requiring digital design and creative problem-solving. (UPB) ○ Builds confidence in sharing professional narratives and community impact stories. (UCL) ○ To build a digital portfolio (e.g., website, blog) that showcases their skills to potential employers. (RI)
	• **HEIs Offering STEAMSS Degrees** ○ Enables institutions to adopt blended and online learning approaches aligned with EU digitalization priorities. (UPB) ○ Enhances institutional visibility and outreach through digital communication projects. (UCL) ○ To develop professional digital marketing materials to promote its green STEAMSS programs. (RI)
	• **Curriculum Developers:** ○ Facilitates integration of digital creativity and maker-based learning into study programs. (UPB) ○ Facilitates inclusion of digital storytelling methods in interdisciplinary learning. (UCL) ○ To design the high-quality, engaging digital OERs that are a core goal of this project. (RI)
	• **Industry Professionals:** ○ Supports professionals in creating digital solutions for marketing, training, and product development. (UPB)

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	○ Enables creation of impactful narratives for CSR campaigns and stakeholde r communication. (UCL) ○ To create compelling sustainability reports, marketing, and internal training materials. (RI)

Examples of Learning Outcomes:

Example of UPB

Dimensions	Description	
Knowledge	Understands principles of digital content creation, including file formats, accessibility standards, and open licensing practices.	
Skills	Is able to design and produce digital content (e.g., visualizations, multimedia resources, interactive materials) using appropriate tools and data sources to communicate ideas effectively.	
Responsibility and Autonomy	Collaboratively develops open digital educational content to address societal needs and specific learning needs.	
Learning Outcome		
By the end of this course, students will be able to design and collaboratively develop open and accessible digital content for social media and learning platforms to address educational and societal challenges through advocacy-oriented Service-Learning projects.		
Curricula/Course associated		
This learning outcome is addressed within the Teaching practium course, master's level)		
Proficiency level		
Foundation	Intermediate	**Advanced**

Example of UCL

Dimensions	Description	
Knowledge	Knowledge of multimedia communication techniques and social impact strategies.	
Skills	Ability to design and create impactful digital content using storytelling principles.	
Responsibility and Autonomy	Demonstrates creativity and social responsibility when sharing digital messages.	
Learning Outcome		
Design and produce digital stories or campaigns that communicate societal or sustainability issues effectively through digital platforms.		
Curricula/Course associated		
Communication; Teacher Training; Business Management (Marketing & Communication)		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of RI

Dimensions	Description
Knowledge	Understanding of digital tools, formats (e.g., video, podcast, infographic), and platforms for creating multimedia content.

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Skills	Ability to produce, edit, and share original digital content ("Digital Storytelling for Sustainability") to communicate complex sustainability ideas.
Responsibility and Autonomy	Takes a creative and responsible approach to digital expression, autonomously selecting the best format and tool to communicate a message.
Learning Outcome	
Create a short, informative video (1-3 minutes) or a compelling infographic that explains a complex sustainability concept to a general audience.	
Curricula/Course associated	
Dijital İçerik Üretimi (Digital Content Creation)	
Proficiency level	

Foundation	**Intermediate**	Advanced

3.2 Integrating and re-elaborating digital content:

To modify, refine and integrate new information and content into an existing body of knowledge and resources to create new, original and relevant content and knowledge.

Partners interested in:

SASS

DigComp Competence	Target Groups with Specific Justification
Digital Content Creation 3.2 Integrating and re-elaborating digital content	• **STEAMSS Students**: ○ Gives them market-relevant skills to create digital portfolios, resumes, and content for career advancement, gives abilty to create new knowledge by building on existing materials while respecting copyright and academic integrity. (SASS)
	• **Educators and Academic Staff:**
	• **Students in Career Transitions:**
	• **HEIs Offering STEAMSS Degrees** ○ Enhances institutional capacity to produce digital learning materials and open educational resources. (SASS)
	• **Curriculum Developers:** ○ Supports the development of open educational resources (OER) and blended learning content. (SASS)
	• **Industry Professionals:**

Examples of Learning Outcomes:

Example of SASS

Dimensions	Description
Knowledge	Understanding of digital formats, media editing tools, and ethical use of online content.

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Skills	Ability to create and rework content using digital tools while maintaining originality and purpose.	
Responsibility and Autonomy	Ability to manage one's own content creation responsibly, respecting ownership and purpose.	
Learning Outcome		
Create, modify, and combine digital content in a meaningful and ethical way for a specific purpose or audience.		
Curricula/Course associated		
Digitalization of Processes		
Proficiency level		
Foundation	**Intermediate**	Advanced

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DigComp – Area 4: Safety

4.2 Protecting personal data and privacy:

To protect personal data and privacy in digital environments.
To understand how to use and share personally identifiable information while being able to protect oneself and others from damages.
To understand that digital services use a “Privacy policy” to inform how personal data is used.

Partners interested in:
SASS, UPM, UCL, RI

DigComp Competence	Target Groups with Specific Justification
Safety 4.2 Protecting personal data and privacy	• **STEAMSS Students**: ○ Protects vulnerable groups from cyber threats, identity theft, and harassment—especially important for women and disadvantaged learners entering STEM or remote learning environments. (UPM) ○ Encourages responsible digital citizenship and understanding of GDPR principles. (UCL) ○ To design technology (e.g., smart grids, health apps) that embeds "privacy by design. (RI)
	• **Educators and Academic Staff:** ○ Ensures they teach digital citizenship, privacy protection, and safe online behaviour. (SASS) ○ Required to safeguard student records, research data, and maintain ethical standards, especially in collaborative or cloud-based settings. (UPM) ○ Provides frameworks for teaching privacy, data ethics, and sustainable IT practices. (UCL) ○ To responsibly handle student data in compliance with GDPR and other regulations. (RI)
	• **Students in Career Transitions:** ○ Builds awareness of professional obligations to protect client and company data. (SASS) ○ Protects vulnerable groups from cyber threats, identity theft, and harassment—especially important for women and disadvantaged learners entering STEM or remote learning environments. (UPM) ○ Builds digital trust and literacy crucial for data-intensive professions. (UCL) ○ To manage their digital footprint and protect their personal data during their job search. (RI)
	• **HEIs Offering STEAMSS Degrees** ○ Reduces institutional risk by embedding data protection culture across departments. (SASS) ○ Enables creation of policies and training for compliance with institutional, legal, and societal privacy standards. (UPM) ○ Ensures institutional compliance with data protection and digital sustainability standards. (UCL) ○ To be legally compliant and protect the data of thousands of students and staff. (RI)
	• **Curriculum Developers**

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	○ Enables creation of policies and training for compliance with institutional, legal, and societal privacy standards. (UPM) ○ Supports integration of data ethics modules across programs, including business and social sciences. (UCL) ○ To ensure all digital tools selected for courses are secure and protect student privacy. (RI)
	• **Industry Professionals:** ○ Fosters trust, meets regulatory requirements, and prepares the workforce to manage private and proprietary information in a secure manner. (UPM) ○ Strengthens ethical decision-making in data management and corporate sustainability. (UCL) ○ To handle customer and environmental data ethically and securely, building trust and avoiding legal penalties. (RI)

Examples of Learning Outcomes:

Example of SASS

Dimensions	**Description**	
Knowledge	Understanding of digital risks, data protection laws (e.g. GDPR), and online privacy tools.	
Skills	Ability to use privacy settings, passwords, and security tools to manage personal information.	
Responsibility and Autonomy	Ability to take responsibility for one's own digital safety and act ethically in protecting others' data and privacy.	
Learning Outcome		
Identify and apply safe and responsible practices to protect personal data, digital identity, and privacy in online environments.		
Curricula/Course associated		
Digital Design and Programming		
Proficiency level		
Foundation	Intermediate	**Advanced**

Example of UPM

Dimensions	**Description**	
Knowledge	Understand principles of data protection laws, privacy risks, and user rights	
Skills	Configure privacy settings, protect personal data, and manage consent in digital environments	
Responsibility and Autonomy	Take responsibility for safeguarding personal and others' data according to regulations	
Learning Outcome		
In typical digital environments, the learner will implement privacy and data security measures in compliance with relevant legal and ethical standards, justifying the steps taken to protect personal and third-party data.		
Curricula/Course associated		
EURO-INF		
Proficiency level		
Foundation	**Intermediate**	Advanced

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Example of UCL

Dimensions	Description	
Knowledge	Understanding of GDPR, data privacy laws, and principles of digital sustainability.	
Skills	Ability to apply ethical data management practices and assess the environmental impact of digital tools	
Responsibility and Autonomy	Acts responsibly and transparently in handling data, ensuring ethical compliance and environmental awareness	
Learning Outcome		
Evaluate and apply ethical standards and sustainability principles when collecting, managing, and storing digital data.		
Curricula/Course associated		
Applied Computer Science; Business IT; Social sciences (digital responsibility modules)		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of RI

Dimensions	Description	
Knowledge	Understanding of data privacy laws (e.g., GDPR, KVKK), cybersecurity principles, and ethical data use, especially in "privacy by design".	
Skills	Ability to apply appropriate privacy settings and security measures (e.g., strong passwords, encryption) to manage personal and project data securely.	
Responsibility and Autonomy	Acts with a responsible and cautious attitude, autonomously ensuring compliance and protecting the privacy of self and others.	
Learning Outcome		
Conduct a privacy and security audit for a small project (e.g., a club website) and create a report of vulnerabilities and recommendations.		
Curricula/Course associated		
Veri Gizliliği ve Güvenliği (Data Privacy and Security)		
Proficiency level		
Foundation	Intermediate	Advanced

4.3 Protecting health and well-being:

To be able to avoid health-risks and threats to physical and psychological well-being while using digital technologies.
To be able to protect oneself and others from possible dangers in digital environments (e.g. cyber bullying).
To be aware of digital technologies for social well-being and social inclusion.

Partners interested in:
UPB

DigComp Competence	Target Groups with Specific Justification
Safety	• **STEAMSS Students**:

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4.3 Protecting health and well-being	○ Protects students from online risks while training them in responsible use of digital technologies.
	• **Educators and Academic Staff:** ○ Helps staff integrate ethics of AI, cybersecurity, and digital responsibility into curricula.
	• **Students in Career Transitions:** ○ Ensures that individuals entering ICT or data roles understand ethical standards and safe practices.
	• **HEIs Offering STEAMSS Degrees** ○ Supports compliance with data protection regulations (GDPR) and responsible AI use at the institutional level.
	• **Curriculum Developers** ○ Encourages inclusion of ethical and safe digital use as a core competence in program learning outcomes.
	• **Industry Professionals:** ○ Ensures alignment with cybersecurity protocols and ethical standards in professional practice.

Examples of Learning Outcomes:

Example of UPB

Dimensions	**Description**
Knowledge	Explains how digital technologies affect physical and mental health, wellbeing, and social interaction, including risks such as digital addiction, cyberbullying, and overexposure to harmful content.
Skills	Designs and creates digital awareness campaigns or learning materials (e.g., blogs, infographics, videos) that promote digital wellbeing and responsible technology use.
Responsibility and Autonomy	Advocates for healthy, balanced, and safe use of technology within communities or educational settings.
Learning Outcome	
By the end of this course students will be able to explain the effects of digital technology on personal and collective wellbeing, design and produce digital materials that promote healthy and responsible digital habits, and advocate for balanced technology use within educational and community contexts	
Curricula/Course associated	
This learning outcome is addressed within the Information Technologies in Education, undergraduate level)	
Proficiency level	
Foundation	Intermediate **Advanced**

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DigComp – Area 5: Problem solving

5.1 Solving technical problems:

To identify technical problems when operating devices and using digital environments, and to solve them (from trouble-shooting to solving more complex problems).

Partners interested in:
UPM

DigComp Competence	Target Groups with Specific Justification
Problem Solving 5.1 Solving techncial problems	• **STEAMSS Students**: Builds resilience and autonomy, allowing students to independently resolve technical difficulties that otherwise hinder progress, engagement, or participation. (UPM)
	• **Educators and Academic Staff:** ○ Facilitates rapid troubleshooting, effective use of digital instructional tools, and empowers staff to support diverse learners. (UPM)
	• **Students in Career Transitions:** ○ Builds resilience and autonomy, allowing students to independently resolve technical difficulties that otherwise hinder progress, engagement, or participation. (UPM)
	• **HEIs Offering STEAMSS Degrees** ○ Underpins programs that emphasize technical agility, adaptability, and innovation crucial for global STEM competitiveness. (UPM)
	• **Curriculum Developers** ○ Underpins programs that emphasize technical agility, adaptability, and innovation crucial for global STEM competitiveness. (UPM)
	• **Industry Professionals:** ○ Fundamental for daily operations, project execution, and the cultivation of a capable, problem-solving workforce in fast-moving sectors. (UPM)

Examples of Learning Outcomes:

Example of UPM

Dimensions	Description
Knowledge	Know common technical issues and troubleshooting processes
Skills	Diagnose, resolve, and document technical problems using digital tools
Responsibility and Autonomy	Autonomously adapt solutions and assist others in troubleshooting digital systems
Learning Outcome	
Given a technical digital problem, the learner will identify the cause, select appropriate troubleshooting methods, and implement a solution effectively, documenting the steps for future reference.	
Curricula/Course associated	

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e-Competence Framework		
Proficiency level		
Foundation	**Intermediate**	Advanced

5.2 Identifying needs and technological responses:

To assess needs and to identify, evaluate, select and use digital tools and posible technological responses and to solve them.
To adjust and customise digital environments to personal needs (e.g. accessibility).

Partners interested in:

UCL

DigComp Competence	Target Groups with Specific Justification
Problem Solving 5.2 Identifying needs and technological responses	• **STEAMSS Students**: ○ Develops understanding of AI concepts and responsible use; empowers critical and ethical application of digital tools. (UCL)
	• **Educators and Academic Staff:** ○ Enables teachers to integrate AI ethics, bias, and emerging technologies into coursework. (UCL)
	• **Students in Career Transitions:** ○ Provides upskilling for digital transformation roles where AI competence is increasingly required. (SASS)
	• **HEIs Offering STEAMSS Degrees** ○ Strengthens institutional capacity for innovation and alignment with EU AI Act priorities. (UCL)
	• **Curriculum Developers** ○ Supports embedding responsible AI use and digital ethics across disciplines. (UCL)
	• **Industry Professionals:** ○ Promotes ethical deployment of AI solutions in workplace and business innovation contexts. (UCL)

Examples of Learning Outcomes:

Example of UCL

Dimensions	Description
Knowledge	Understanding of AI principles, automation, and emerging technologies and their potential societal impact.
Skills	Ability to use AI-based systems and assess their outputs critically and ethically.
Responsibility and Autonomy	Demonstrates awareness of data bias, accountability, and ethical considerations in applying AI tools.

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Learning Outcome		
Apply AI tools and emerging technologies responsibly and critically within professional or educational contexts, considering ethical, societal, and environmental implications.		
Curricula/Course associated		
For the course Fundamentals of Education and Curriculum Theory: Related curricula: Applied computer science, IT&Business; Teacher training (AI and society)		
Proficiency level		
Foundation	**Intermediate**	Advanced

5.3 Creatively using digital technology:

To use digital tools and technologies to create knowledge and to innovate processes and products. To engage individually and collectively in cognitive processing to understand and resolve conceptual problems and problema situations in digital environments.

Partners interested in:
SASS, UPB, UCL, RI

DigComp Competence	Target Groups with Specific Justification
Problem Solving 5.3 Creatively using digital technology	• **STEAMSS Students**: ○ Builds confidence and encourages experimentation with digital tools to fing creative solutions, fostering innovation. ○ Equips students to use digital tools to address real-world sustainability and innovation challenges. (UPB) ○ Develops analytical and creative thinking in real-life digital projects. (UCL) ○ To use technology in novel ways to solve sustainability problems (e.g., AI for biodiversity monitoring). (RI)
	• **Educators and Academic Staff:** ○ Supports innovative teaching practices using simulation, coding, and data-driven tools. For instance, the GreenSCENT project created the GreenVerse tool that allows the creation of actual documentaries based on immersive content. (UPB) ○ Encourages project-based and inquiry-oriented teaching methods. (UCL) ○ To use digital tools to invent new, more effective pedagogies and learning experiences. (RI)
	• **Students in Career Transitions:** ○ Provides reskilling pathways into ICT and green jobs requiring digital troubleshooting and innovation. (UPB) ○ Reinforces transversal skills for adapting to new professional contexts. (UCL) ○ To creatively use digital tools to automate tasks and find innovative solutions in their new role. (RI)
	• **HEIs Offering STEAMSS Degrees** ○ Strengthens institutional strategies for digital innovation in learning and research; improves the support offered to academic and administrative staff; aligns with national priorities (the Digitalization Strategy, the National Recovery and Resilience Plan, the National Strategy for Research, Innovation, and Smart Specialization 2022-2027) (UPB)

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	○ Promotes innovation and continuous improvement in institutional practices. (UCL) ○ To foster a culture of digital innovation that goes beyond simple digitization. (RI)
	• **Curriculum Developers** ○ Encourage integration of digital problem- based learning scenarios and adaptive technologies in curricula. (SASS) ○ Facilitates embedding of digital problem-solving competences across academic programs. (UPB) ○ Supports design of interdisciplinary, challenge-based learning environments. (UCL) ○ To design "Design Challenges" and "Hackathons" that push students to be creative with tech. (RI)
	• **Industry Professionals:** ○ Strengthens employees' ability to solve technology-related challenges and adopt innovative digital solutions. (SASS) ○ Helps optimize workflows and adopt innovative digital solutions in industries like energy, ICT, and manufacturing. (UPB) ○ Builds competence to tackle technical and managerial challenges with digit al tools. (UCL) ○ To lead digital transformation, using technology to create new, sustainable business models. (RI)

Examples of Learning Outcomes:

Example of UPB

Dimensions	**Description**
Knowledge	Describes how digital technologies can be used to generate new ideas, products, or processes that create social, cultural, or economic value.
Skills	Uses digital tools and platforms to develop and present innovative solutions to real-life problems (e.g., through digital storytelling, design thinking, or prototyping).
Responsibility and Autonomy	Collaborates with others to co-design and co-create digital products or services that address community or educational needs.
Learning Outcome	
By the end of this course, students will be able to apply digital technologies creatively to design and co-develop innovative solutions to educational or societal challenges in the Learnathon context.	
Curricula/Course associated	
Note 1: This learning outcome is addressed within the Learning Theories and Design, master's level) Note 2: The Learnathon is a social hackathon focusing on designing solutions to address learning needs (e.g., board games, apps)	
Proficiency level	
Foundation	**Intermediate** Advanced

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Example of SASS

Dimensions	Description		
Knowledge	Awareness of different digital tools, platforms, and their functions in creative problem-solving.		
Skills	Ability to experiment with and apply digital tools to develop original or improved solutions.		
Responsibility and Autonomy	Confidence in using digital tools independently and responsibly to generate new ideas or solve challenges.		
Learning Outcome			
Use digital tools creatively to solve technical or learning-related problems and to support innovative thinking			
Curricula/Course associated			
Digital Design and Programming			
Proficiency level			
Foundation	Intermediate	**Advanced**	

Example of UCL

Dimensions	Description		
Knowledge	Understanding of structured problem-solving methods and project management using digital tools.		
Skills	Ability to identify problems, generate creative digital solutions, and evaluate outcomes.		
Responsibility and Autonomy	Works independently and collaboratively to implement and assess digital solutions ethically.		
Learning Outcome			
Use digital technologies to analyse problems, test solutions, and improve processes within educational or professional projects.			
Curricula/Course associated			
Innovation Labs; Project-Based Learning; Engineering and Business programmes. For the course Project-Based learning			
Proficiency level			
Foundation	**Intermediate**	Advanced	

Example of RI

Dimensions	Description		
Knowledge	Knowledge of how existing and emerging digital technologies (e.g., AI, IoT, AR/VR) can be applied to solve sustainability challenges.		
Skills	Ability to identify and apply digital tools in novel ways to create innovative solutions, models, or processes for sustainability.		
Responsibility and Autonomy	Demonstrates a proactive and innovative mindset, autonomously exploring how technology can be used as a force for positive change.		
Learning Outcome			
Propose a new digital solution (e.g., an app concept) that uses technology creatively to address a specific sustainability problem.			
Curricula/Course associated			
İnovasyon ve Teknoloji Yönetimi (Innovation and Technology Management)			
Proficiency level			
Foundation	Intermediate	**Advanced**	

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2. From ENTRECOMP

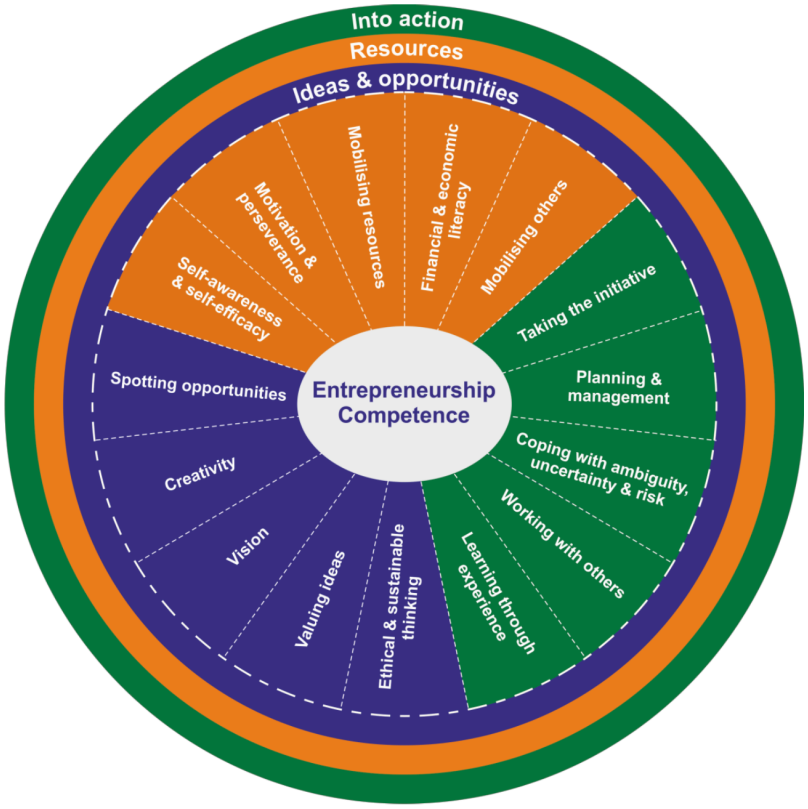

Figure 4. The EntreComp conceptual reference model

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EntreComp – Area 1: Ideas and opportunities

Ability to generate, develop, and refine innovative ideas that create value.

1.1 Spotting opportunities:

Use your imagination and abilities to identify opportunities for creating value

Partners interested in:
UPM, UCL, RI

EntreComp Competence	Target Groups with Specific Justification
Ideas and Opportunities Spotting opportunities	• **STEAMSS Students**: ○ Trains learners to identify new ideas, advance their careers, and create solutions that address emerging problems—especially helpful for those seeking entry or advancement in STEM fields. (UPM) ○ Helps identify opportunities in emerging sustainability and digital markets. (UCL) ○ To see challenges (e.g., waste stream) as opportunities for value creation (e.g., circular economy startup). (RI)
	• **Educators and Academic Staff:** ○ Equips faculty to recognize and act on new pedagogical or research possibilities, enhancing educational impact. (UPM) ○ Provides frameworks for teaching opportunity recognition and design thinking. (UCL) ○ To spot new research grants, industry partnerships, and project opportunities. (RI)
	• **Students in Career Transitions:** ○ Trains learners to identify new ideas, advance their careers, and create solutions that address emerging problems—especially helpful for those seeking entry or advancement in STEM fields. (UPM) ○ Fosters awareness of new niches in renewable energy, IT, and creative industries. (UCL) ○ To identify gaps in the green job market and proactively develop the niche skills to fill them. (RI)
	• **HEIs Offering STEAMSS Degrees** ○ Drives identification of gaps and opportunities to innovate academic offerings and partnerships. (UPM) ○ Encourages collaboration with external partners for identifying applie d challenges. (UCL) ○ To identify new strategic directions for the institution to grow and create value. (RI)
	• **Curriculum Developers:** ○ Drives identification of gaps and opportunities to innovate academic offerings and partnerships. (UPM) ○ Integrates market analysis and social innovation modules across programs. (UCL) ○ To identify emerging trends and design new courses that meet future market needs. (RI)
	• **Industry Professionals:**

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	○ Fosters entrepreneurial vision, business development, and the ability to respond to technological and market changes. (UPM) ○ Enables strategic identification of trends and business opportunities. (UCL) ○ To identify new markets, sustainable business models, and innovative solutions (eco-entrepreneurship). (RI)

Examples of Learning Outcomes

Example of UPM

Dimensions	Description	
Knowledge	Understands economic, technological, social, and market contexts to recognize potential opportunities	
Skills	Conducts research, analyzes data, and evaluates opportunities using entrepreneurial thinking	
Responsibility and Autonomy	Independently prioritizes and acts upon opportunities, balancing risks and benefits	
Learning Outcome		
Systematic identification and evaluation of entrepreneurial opportunities with focus on STEM and innovation contexts		
Curricula/Course associated		
ABET		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of UCL

Dimensions	Description	
Knowledge	Understanding of market analysis, societal needs assessment, and innovation ecosystems.	
Skills	Ability to analyse contexts, recognise trends, and transform challenges into entrepreneurial opportunities.	
Responsibility and Autonomy	Demonstrates curiosity, proactiveness, and responsibility in opportunity exploration.	
Learning Outcome		
Identify and assess entrepreneurial or social innovation opportunities that align with sustainability and market demands.		
Curricula/Course associated		
For the course Business Management		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of RI

Dimensions	Description
Knowledge	Understanding of market trends, societal needs (especially in the green economy), and the potential for innovation (e.g., circular economy).
Skills	Ability to identify and evaluate challenges (e.g., a waste stream) as opportunities for value creation (e.g., a new business model).

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Responsibility and Autonomy	Maintains an opportunity-oriented and visionary mindset, proactively taking the initiative to develop and propose new, sustainable solutions.
Learning Outcome	
Identify a local sustainability problem and draft a "Business Model Canvas" for a social enterprise designed to solve it.	
Curricula/Course associated	
Girişimcilik ve İnovasyon (Entrepreneurship and Innovation)	
Proficiency level	
Foundation	Intermediate **Advanced**

1.2 Creativity:

Develop creative and purposeful ideas

Partners interested in:
SASS, UPB, UPM, UCL, RI

EntreComp Competence	Target Groups with Specific Justification
Ideas and Opportunities Creativitiy	• **STEAMSS Students**: ○ Encourages them to explore multiple approaches to problems, improving innovation and entrepreneurship readiness. ○ Helps students translate ideas into impactful projects with social and environmental relevance. (UPB) ○ Unlocks diverse problem-solving approaches and fosters innovation—crucial when facing unfamiliar tasks or entering new scientific domains. Empowers minority groups with presence and visibility in new solutions. (UPM) ○ Stimulates idea generation and innovation in academic and project contexts. (UCL) ○ To find innovative, "out-of-the-box" solutions to technical and social sustainability problems. (RI)
	• **Educators and Academic Staff:** ○ Equips teachers to design creative, project-based learning experiences that engage diverse learners. (SASS) ○ Enables staff to integrate social entrepreneurship and circular economy practices into their teaching. (UPB) ○ Enables innovative teaching, classroom engagement, and adaptation of methods for various learning needs. (UPM) ○ Strengthens ability to use creative pedagogies such as design thinking. (UCL) ○ To develop engaging and novel teaching methods (e.g., gamification, design challenges). (RI)
	• **Students in Career Transitions:** ○ Supports career changers in applying entrepreneurial design thinking to sustainability and ICT fields. (UPB) ○ Unlocks diverse problem-solving approaches and fosters innovation—crucial when facing unfamiliar tasks or entering new scientific domains. Empowers minority groups with presence and visibility in new solutions. (UPM)

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	○ Encourages self-expression and creative problem-solving for new roles. (UCL) ○ To creatively frame their existing skills and experience to fit new green job descriptions. (RI)
	• **HEIs Offering STEAMSS Degrees** ○ Aligns institutional missions with responsible innovation, encouraging partnerships for sustainable growth. (UPB) ○ Drives curriculum modernization and ensures programs remain relevant to evolving fields.(UPM) ○ Promotes institutional culture of innovation and experimentation. (UCL) ○ To build a reputation as a hub for innovation, attracting creative talent and research funding. (RI)
	• **Curriculum Developers** ○ Facilitates the creation of cross-disciplinary projects that generate societal and environmental value. (UPB) ○ Drives curriculum modernization and ensures programs remain relevant to evolving fields.(UPM) ○ Facilitates inclusion of creative methodologies in interdisciplinary curricula. (UCL) ○ To design inspiring and imaginative learning experiences that motivate students. (RI)
	• **Industry Professionals:** ○ Supports innovation in product design,research, and process improvement, crucial for competitive advantage. (SASS) ○ Provides a framework for designing green business models and innovative digital products. (UPB) ○ Essential for R&D, business growth, and competitive advantage through creative technical and organizational solutions.(UPM) ○ Fosters creative mindset for product and process innovation. (UCL) ○ To drive innovation, develop new sustainable products, and move beyond "business as usual." (RI)

Examples of Learning Outcomes

Example of UPB

Dimensions	Description
Knowledge	Describes key processes for generating and developing creative ideas that create value for others.
Skills	Develops, tests, and refines multiple ideas using creative methods and digital tools to address real or perceived needs.
Responsibility and Autonomy	Transforms selected ideas into feasible solutions that generate social, cultural, or economic value for others, showing initiative and perseverance throughout the process.
Learning Outcome	
By the end of this course, students will be able to create innovative Service-Learning project solutions that respond to community or societal needs by generating and refining ideas, applying creative and collaborative methods, and developing feasible activities that provide tangible value for community partners.	
Curricula/Course associated	

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Note: This learning outcome is addressed within the Learning Theories and Design, master's level		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of SASS

Dimensions	**Description**
Knowledge	Understanding key concepts of creativity and innovation, including techniques for idea generation, design thinking, and creative problem-solving; recognizing the relationship between creativity, value creation, and entrepreneurship.
Skills	Applying creative thinking tools and methods (e.g., brainstorming, mind mapping, lateral thinking) to generate original ideas and improve existing solutions; critically evaluating and refining ideas to enhance their feasibility and impact.
Responsibility and Autonomy	Demonstrating initiative and openness to experimentation; taking responsibility for transforming ideas into action within a team or individual context; reflecting on outcomes and adapting approaches based on feedback and new insights.
Learning Outcome	
Apply creative thinking techniques to identify and develop innovative ideas that respond to social, organizational, or market needs and can be transformed into value-creating opportunities.	
Curricula/Course associated	
Professional and Scientific Treatment of Environmental Issues	
Proficiency level	
Foundation	Intermediate **Advanced**

Example of UPM

Dimensions	**Description**
Knowledge	Knows diverse creativity methodologies and innovation strategies
Skills	Generates and develops innovative ideas to solve technical and societal challenges in STEM
Responsibility and Autonomy	Demonstrates initiative and resilience to foster creativity within teams and projects
Learning Outcome	
Application of creative processes and techniques to design innovative and effective STEM solutions	
Curricula/Course associated	
Computing Curricula 2020	
Proficiency level	
Foundation	**Intermediate** Advanced

Example of UCL

Dimensions	**Description**
Knowledge	Awareness of creative processes, ideation techniques, and innovation frameworks.
Skills	Ability to generate, prototype, and refine ideas using collaborative and reflective approaches.

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Responsibility and Autonomy	Demonstrates openness, experimentation, and persistence in developing new ideas.
Learning Outcome	
Apply creative thinking and design based approaches to develop innovative products, services, orlearning activities.	
Curricula/Course associated	
For the course Co-creation and design thinking workshops	
Proficiency level	
Foundation	**Intermediate** Advanced

Example of RI

Dimensions	**Description**
Knowledge	Understanding of the design thinking process, ideation techniques (e.g., brainstorming, "what if" scenarios), and rapid prototyping methods.
Skills	Ability to generate a high volume of ideas, receive and integrate critical feedback, and build low-fidelity prototypes.
Responsibility and Autonomy	Demonstrates curiosity and openness to new ideas, working autonomously to test and iterate potential solutions in the face of ambiguity or failure.
Learning Outcome	
Develop and present a novel, low-fidelity prototype (e.g., a storyboard, app mock-up) for a tool that addresses a local sustainability challenge.	
Curricula/Course associated	
Yaratıcı Düşünme Teknikleri (Creative Thinking Techniques)	
Proficiency level	
Foundation	**Intermediate** Advanced

1.4 Valuing Ideas:

Make the most of ideas and opportunities

Partners interested in:
UPB

EntreComp Competence	Target Groups with Specific Justification
Ideas and Opportunities Valuing Ideas	• **STEAMSS Students**: ○ Encourages students to identify sustainability-driven opportunities, such as green start-ups or digital innovation challenges. (UPB)
	• **Educators and Academic Staff:** ○ Provides tools for teaching creative thinking and opportunity recognition as part of entrepreneurship modules. (UPB)
	• **Students in Career Transitions:** ○ Helps career changers recognize market niches in Romania's growing renewable energy and IT sectors. (UPB)
	• **HEIs Offering STEAMSS Degrees**

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	○ Positions universities as incubators for sustainable and digital innovation, aligning with European priorities. (UPB)
	• **Curriculum Developers** ○ Supports embedding innovation-driven approaches across curricula, including hackathons and project-based learning. (UPB)
	• **Industry Professionals:** ○ Equips professionals to anticipate market shifts and innovate in response to consumer demand for sustainable solutions. (UPB)

Examples of Learning Outcomes

Example of UPB

Dimensions	**Description**	
Knowledge	Explains how ideas can create different types of value (e.g., social, cultural, environmental, or economic) for individuals and communities.	
Skills	Assesses and prioritizes ideas in terms of their feasibility, relevance, and potential to create positive impact within Service-Learning projects.	
Responsibility and Autonomy	Develops and implements strategies to maximize the value generated by project ideas, ensuring that benefits are sustainable and meaningful for community partners and stakeholders.	
Learning Outcome		
By the end of this course, students will be able to create sustainable and meaningful impact for the community through Service-Learning projects by assessing the value and feasibility of their ideas and implementing appropriate strategies.		
Curricula/Course associated		
This learning outcome is addressed within the Teaching Practicum course, master's level		
Proficiency level		
Foundation	**Intermediate**	Advanced

1.5 Ethical and Sustainable Thinking:

Assess the consequences and impact of ideas, opportunities and actions

Partners interested in:
SASS, UPM, RI

EntreComp Competence	Target Groups with Specific Justification
Ideas and Opportunities Ethical and Sustainable Thinking	• **STEAMSS Students**: ○ Ensures graduates consider social, environmental, and ethical impacts of their projects, aligning with EU sustainability goals. (SASS) ○ Teaches responsibility and awareness of broader impact—preparing graduates to avoid harm and contribute positively to society, technology, and the environment. (UPM)

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	○ To ground their technical work in a strong ethical framework, considering long-term societal well-being. (RI)
	• **Educators and Academic Staff:** ○ Helps teachers integrate ethics and sustainability as cross-cutting themes across curricula. (SASS) ○ Ensures ethical standards are integrated into education and research. Guides faculty to mentor responsible innovators (UPM) ○ To act as role models, demonstrating professional integrity and a commitment to sustainability. (RI)
	• **Students in Career Transitions:** ○ Teaches responsibility and awareness of broader impact—preparing graduates to avoid harm and contribute positively to society, technology, and the environment. (UPM) ○ To evaluate potential employers and choose companies that align with their personal values. (RI)
	• **HEIs Offering STEAMSS Degrees** ○ Supports SDG integration and compliance, reinforcing the institution's social mission. (UPM) ○ To build public trust and a strong brand reputation by committing to ethical and sustainable operations. (RI)
	• **Curriculum Developers:** ○ Encourages the design of programs that explicitly address social responsibility and sustainable impact. (SASS) ○ Supports SDG integration and compliance, reinforcing the institution's social mission. (UPM) ○ To embed ethics as a non-negotiable component of all STEAMSS training, not just a single module. (RI)
	• **Industry Professionals:** ○ Critical for maintaining public trust, regulatory compliance, and the long-term viability of innovation in global markets. (UPM) ○ To make responsible decisions that balance profit with social and environmental impact. (RI)

Examples of Learning Outcomes

Example of SASS

Dimensions	Description
Knowledge	Understanding the interconnections between ethics, sustainability, and entrepreneurship; recognizing frameworks and standards for responsible and sustainable decision-making.
Skills	Applying ethical reasoning and sustainability assessment tools to evaluate the broader impact of initiatives; incorporating principles of social responsibility, environmental stewardship, and long-term value creation.
Responsibility and Autonomy	Demonstrating commitment to ethical and sustainable practices in personal and professional contexts; taking responsibility for promoting integrity, transparency, and sustainability within teams and organizations.
Learning Outcome	
Integrate ethical reflection and sustainability principles into decision-making processes by evaluating the social, environmental, and economic consequences of ideas and actions.	

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Curricula/Course associated		
Social Responsibility and Sustainable Development		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of UPM

Dimensions	Description
Knowledge	Knows ethical frameworks, sustainability goals, and relevant regulations
Skills	Applies ethical analysis and sustainability assessments to guide decision-making
Responsibility and Autonomy	Demonstrates consistent responsibility and accountability in ethical and sustainable conduct
Learning Outcome	
Integration of ethical principles and sustainability considerations into decision-making and problem-solving in STEM	
Curricula/Course associated	
EURO-INF	
Proficiency level	
Foundation	**Intermediate**	Advanced

Example of RI

Dimensions	Description
Knowledge	Knowledge of ethical principles, sustainability challenges, and the principles of responsible entrepreneurship and "Just Transition".
Skills	Ability to make decisions that consider and balance long-term ethical, social, and environmental impacts (e.g., using an ethics checklist).
Responsibility and Autonomy	Acts with a conscious and principled mindset, taking responsibility for the long-term societal well-being and consequences of their actions.
Learning Outcome	
Analyze a business case study and identify at least three key ethical or sustainability dilemmas, proposing a responsible course of action.	
Curricula/Course associated	
İş Etiği ve Sosyal Sorumluluk (Business Ethics and Social Responsibility)	
Proficiency level	
Foundation	**Intermediate**	Advanced

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EntreComp – Area 2: Resources

Skill to gather and manage the material, digital, and human resources needed to turn ideas into reality.

2.2 Motivation and Perseverance:

Stay focused and don't give up

Partners interested in:
UPM, RI

EntreComp Competence	Target Groups with Specific Justification
Resources Motivation and Perseverance	• **STEAMSS Students**: ○ Builds personal resilience in overcoming academic setbacks, barriers to entry, or social exclusion—particularly relevant for women and disadvantaged groups. (UPM) ○ To maintain focus and resilience when tackling difficult, long-term research problems. (RI)
	• **Educators and Academic Staff:** ○ Helps teachers and researchers persist in the face of institutional, pedagogical, or scientific challenges. (UPM) ○ To support and mentor students through academic and personal challenges. (RI)
	• **Students in Career Transitions:** ○ Builds personal resilience in overcoming academic setbacks, barriers to entry, or social exclusion—particularly relevant for women and disadvantaged groups. (UPM) ○ To stay self-driven and persistent during the challenging process of finding a new career path. (RI)
	• **HEIs Offering STEAMSS Degrees:** ○ Fosters cultures of continuous improvement and high achievement within programs. (UPM) ○ To support the long-term, multi-year research and institutional changes needed for sustainability. (RI)
	• **Curriculum Developers** ○ Fosters cultures of continuous improvement and high achievement within programs. (UPM) ○ To create learning paths that are appropriately challenging but scaffolded to build student confidence. (RI)
	• **Industry Professionals:** ○ Enables professionals to adapt, learn, and persist through failures or shifting conditions, which is vital in dynamic STEM industries. (UPM) ○ To champion complex sustainability projects that may take years to show a return on investment. (RI)

Examples of Learning Outcomes

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Example of UPM

Dimensions	Description	
Knowledge	Understands motivational theories and common barriers to perseverance	
Skills	Applies self-regulation and strategies to maintain motivation and overcome obstacles	
Responsibility and Autonomy	Holds self accountable for progress and encourages perseverance in collaborative contexts	
Learning Outcome		
Sustained commitment and adaptive effort in pursuing STEM learning and professional goals		
Curricula/Course associated		
ABET		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of RI

Dimensions	Description	
Knowledge	Understanding of goal-setting strategies (e.g., SMART goals), resilience-building techniques, and personal development pathways.	
Skills	Ability to stay focused, overcome obstacles, and pursue long-term objectives persistently, especially in complex sustainability projects.	
Responsibility and Autonomy	Demonstrates a determined and self-driven attitude, taking personal responsibility for achieving goals and managing their own motivation.	
Learning Outcome		
Set and pursue a long-term (e.g., 3-month) personal learning goal related to sustainability, documenting progress and challenges in a reflective journal.		
Curricula/Course associated		
Kariyer Planlama ve Geliştirme (Career Planning and Development)		
Proficiency level		
Foundation	Intermediate	Advanced

2.3 Mobilizing Resources:

Gather and manage the resources you need

Partners interested in:
SASS, UPB, UCL

EntreComp Competence	Target Groups with Specific Justification
Resources Mobilizing Resources	• **STEAMSS Students**: ○ Prepares them to seek funding, partnerships, and tools for research and start-up ventures. (SASS) ○ Empowers students to access funding, grants, and technological resources for projects. (UPB) ○ Teaches how to identify and leverage resources for innovation projects. (UCL)

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	• **Educators and Academic Staff:** ○ Encourages integration of resource mobilization and project management in teaching activities. (UPB) ○ Strengthens capacity to guide students in building partnerships and securin g funding. (UCL)
	• **Students in Career Transitions:** ○ Helps career changers leverage available tools and networks to reskill and enter new sectors. (UPB) ○ Encourages strategic networking and collaborative project management (UCL)
	• **HEIs Offering STEAMSS Degrees:** ○ Strengthens institutional ability to leverage grants and partnerships to support educational transformation. (UPB) ○ Enhances institutional collaboration with community and industry partners. (UCL)
	• **Curriculum Developers** ○ Supports embedding entrepreneurial resource strategies into program design. (UPB) ○ Promotes inclusion of teamwork and co-creation elements in course design. (UCL)
	• **Industry Professionals:** ○ Builds skills for resource allocation and efficient project management in sustainability and innovation projects. (SASS) ○ Equips professionals to align organizational resources with sustainability and digital transformation goals. (UPB) ○ Builds competence to mobilize human and material resources efficiently. (UCL)

Examples of Learning Outcomes

Example of UPB

Dimensions	Description
Knowledge	Explains different types of resources (e.g., human, material, digital, financial, informational) and how they can be mobilised responsibly to support project goals.
Skills	Identifies, gathers, and manages appropriate resources to implement innovative or Service-Learning projects effectively and ethically.
Responsibility and Autonomy	Develops and applies strategies to mobilise and coordinate resources efficiently, ensuring their sustainable and responsible use to create value for community or educational stakeholders.
Learning Outcome	
By the end of this course, students will be able to mobilise and manage diverse resources responsibly to support the design and implementation of innovative or Service-Learning project solutions that generate sustainable value for others	

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Curricula/Course associated		
This learning outcome is addressed within the Teaching Practicum course, master's level		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of SASS

Dimensions	Description
Knowledge	Understanding the types of resources (material, digital, financial, and human) required for implementing innovative ideas; recognizing methods for resource planning, budgeting, and allocation.
Skills	Applying strategies for identifying, acquiring, and organizing necessary resources; using digital tools and collaborative approaches to optimize resource utilization and ensure efficiency.
Responsibility and Autonomy	Demonstrating accountability in managing resources ethically and sustainably; taking initiative in coordinating people and assets; adapting resource management strategies based on project needs and constraints.
Learning Outcome	
Mobilize and manage material, digital, financial, and human resources effectively to transform ideas into viable and sustainable actions or projects.	
Curricula/Course associated	
Practicals in Computer Science; Environmental Management	
Proficiency level	
Foundation / Intermediate / **Advanced**	

Example of UCL

Dimensions	Description
Knowledge	Understanding of resource networks, stakeholder engagement, and collaborative project design.
Skills	Ability to acquire and allocate resources efficiently and foster cooperation across teams.
Responsibility and Autonomy	Demonstrates leadership, initiative, and ethical responsibility in resource management.
Learning Outcome	
Mobilise and coordinate diverse resources responsibly to implement innovation projects that generate sustainable value.	
Curricula/Course associated	
For the course Project management	
Proficiency level	
Foundation / **Intermediate** / Advanced	

2.4 Financial and Resource Management

Develop financial and economic know how

Partners interested in:
UCL

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EntreComp Competence	Target Groups with Specific Justification
Resources Fiinancial and Resource Management	• **STEAMSS Students**: ○ Stimulates idea generation and innovation in academic and project c ontexts. (UCL)
	• **Educators and Academic Staff:** ○ Strengthens ability to use creative pedagogies such as design thinking. (UCL)
	• **Students in Career Transitions:** ○ Encourages self-expression and creative problem-solving for new roles. (UCL)
	• **HEIs Offering STEAMSS Degrees:** ○ Promotes institutional culture of innovation and experimentation. (UCL)
	• **Curriculum Developers** ○ Facilitates inclusion of creative methodologies in interdisciplinary curr icula. (UCL)
	• **Industry Professionals:** ○ Fosters creative mindset for product and process innovation. (UCL)

Examples of Learning Outcomes

Example of UCL

Dimensions	Description
Knowledge	Understanding of budgeting, funding models, and financial planning principles.
Skills	Ability to develop and monitor budgets, optimise resource use, and assess financial risks.
Responsibility and Autonomy	Takes accountability for transparent and sustainable financial decisions.
Learning Outcome	
The ability to plan, manage, and evaluate financial and material resources to support project orventure success.	
Curricula/Course associated	
For the course Business Management	
Proficiency level	
Foundation	**Intermediate** Advanced

2.5 Mobilizing Others:

Inspire, enthuse and get others on board

Partners interested in:

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SASS, UPB, UCL

EntreComp Competence	Target Groups with Specific Justification
Resources Mobilizing Others	• **STEAMSS Students**: ○ Inspires students to develop sustainable and impactful business ideas. (UCL)
	• **Educators and Academic Staff:** ○ Provides teaching approaches for integrating sustainability into entrepreneurship modules. (UCL)
	• **Students in Career Transitions:** ○ Supports reskilling towards sustainability-oriented enterprises. (UCL)
	• **HEIs Offering STEAMSS Degrees:** ○ Positions universities as incubators for green entrepreneurship and community projects. (UCL)
	• **Curriculum Developers** ○ Enables inclusion of sustainability-driven innovation courses. (UCL)
	• **Industry Professionals:** ○ Encourages adoption of sustainable business models and collaborative innovation. (UCL)

Examples of Learning Outcomes

Example of UCL

Dimensions	Description
Knowledge	Understanding of sustainability-oriented entrepreneurship, innovation processes, and circular business models.
Skills	Ability to design and execute projects that integrate economic viability with social and environmental impact.
Responsibility and Autonomy	Demonstrates initiative, creativity, and accountability in driving sustainable change.
Learning Outcome	
Develop and implement sustainability-driven entrepreneurial projects that address social, economic, or environmental challenges.	
Curricula/Course associated	
For the course Project-Based Learning	
Proficiency level	
Foundation	**Intermediate** Advanced

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EntreComp – Area 3: Into action

Ability to cooperate, network, and resolve conflicts to achieve shared goals.

3.2 Planning and Management:

Prioritize, organize and follow-up

Partners interested in:
SASS

EntreComp Competence	Target Groups with Specific Justification
Into action Planning and Management	• **STEAMSS Students**:
	• **Educators and Academic Staff:**
	• **Students in Career Transitions:**
	• **HEIs Offering STEAMSS Degrees** ○ Builds institutional capacity for managing change and implementing strategic initiatives.
	• **Curriculum Developers** ○ Enables creation of coherent, outcome-driven courses and programs that prepare students for real-world challenges.
	• **Industry Professionals:** ○ Equips them with structured project management skills that translate to leadership roles, opening opportunities for women and career changers.

Examples of Learning Outcomes

Example of SASS

Dimensions	Description
Knowledge	Understanding the principles of strategic and operational planning, goal setting, time management, and performance monitoring; recognizing tools and methods for managing projects and assessing progress.
Skills	Applying planning and management techniques to define objectives, establish priorities, allocate resources, and coordinate tasks; using digital tools to track performance and ensure continuous improvement.
Responsibility and Autonomy	Demonstrating accountability in planning and implementing tasks; taking initiative in adapting plans to changing circumstances; reflecting on outcomes to improve future planning and management processes.
Learning Outcome	
Plan, organize, and manage activities and resources efficiently to achieve defined objectives, monitor progress, and adapt actions based on evaluation and feedback.	
Curricula/Course associated	
Environmental Management	
Proficiency level	

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Foundation	**Intermediate**	Advanced

3.3 Coping with Uncertatinty, Ambiguity & Risk:

Make decisions dealing with uncertainty, ambiguity and risk

Partners interested in:
UPB

EntreComp Competence	Target Groups with Specific Justification
Into action Coping with Uncertatinty, Ambiguity & Risk	• **STEAMSS Students**: ○ Prepares students to manage unpredictable challenges in green and digital transitions. (UPB)
	• **Educators and Academic Staff:** ○ Helps educators teach resilience and adaptability as transversal competences. (UPB)
	• **Students in Career Transitions:** ○ Supports resilience for career changers entering emerging, uncertain sectors like AI or renewable energy. (UPB)
	• **HEIs Offering STEAMSS Degrees** ○ Strengthens capacity to adapt curricula and policies to uncertain societal and technological contexts. (UPB)
	• **Curriculum Developers** ○ Provides rationale for embedding risk analysis and resilience-building into programs. (UPB)
	• **Industry Professionals:** ○ Strengthens capacity to adapt curricula and policies to uncertain societal and technological contexts. (UPB)

Examples of Learning Outcomes

Example of UPB

Dimensions	Description
Knowledge	To make decisions and take action even when outcomes are uncertain, balancing risks and opportunities responsibly.
Skills	Evaluates potential risks, benefits, and alternative courses of action when facing complex or unclear situations
Responsibility and Autonomy	Makes informed and responsible decisions in uncertain or rapidly changing contexts, demonstrating adaptability, resilience, and confidence while learning from experimentation and failure
Learning Outcome	
By the end of this course, students will be able to make informed and responsible decisions in uncertain or ambiguous situations by evaluating risks, anticipating potential outcomes, and	

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adapting their approaches to achieve meaningful results in Service-Learning or innovation projects		
Curricula/Course associated		
This learning outcome is addressed within the Teaching Practicum course, master's level		
Proficiency level		
Foundation	**Intermediate**	Advanced

3.4 Working with Others:

Team up, collaborate and network

Partners interested in:
SASS, UPM, UPB, RI

EntreComp Competence	Target Groups with Specific Justification
Into action Working with Others	• **STEAMSS Students**: ○ Improves networking, teamwork, and conflict resolution across academia, industry, and student cohorts. **Particularly important for inclusion:** it promotes mentorship opportunities and supports women and underrepresented groups. (SASS) ○ Promotes teamwork and interdisciplinary collaboration, essential in sustainability projects. (UPB) ○ Prepares learners for collaboration—essential for modern scientific practice, teamwork, and inclusion in professional communities. (UPM) ○ To learn to communicate complex technical ideas to non-technical stakeholders (e.g., managers, public). (RI)
	• **Educators and Academic Staff:** ○ Improves networking, teamwork, and conflict resolution across academia, industry, and student cohorts. **Particularly important for inclusion:** it promotes mentorship opportunities and supports women and underrepresented groups. (SASS) ○ Encourages co-teaching and mentoring approaches aligned with collaborative learning methods. (UPB) ○ Enables cross-disciplinary and cross-cultural collaboration, driving research and teaching effectiveness. (UPM) ○ To co-teach interdisciplinary courses and collaborate on research with other departments. (RI)
	• **Students in Career Transitions:** ○ Improves networking, teamwork, and conflict resolution across academia, industry, and student cohorts. **Particularly important for inclusion:** it promotes mentorship opportunities and supports women and underrepresented groups. (SASS) ○ Helps career changers quickly integrate into collaborative teams and networks. (UPB) ○ Prepares learners for collaboration—essential for modern scientific practice, teamwork, and inclusion in professional communities. (UPM) ○ To build a professional network and collaborate effectively with people from different backgrounds. (RI)

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	• **HEIs Offering STEAMSS Degrees** ○ Improves networking, teamwork, and conflict resolution across academia, industry, and student cohorts. **Particularly important for inclusion:** it promotes mentorship opportunities and supports women and underrepresented groups. (SASS) ○ Facilitates partnerships with other institutions and stakeholders to advance sustainable innovation. (UPB) ○ Facilitates broader, team-based and interdisciplinary educational models. (UPM) ○ To create a collaborative campus environment that breaks down administrative and academic silos. (RI)
	• **Curriculum Developers** ○ Improves networking, teamwork, and conflict resolution across academia, industry, and student cohorts. **Particularly important for inclusion:** it promotes mentorship opportunities and supports women and underrepresented groups. (SASS) ○ Supports inclusion of teamwork, group projects, and collaborative assessment methods. (UPB) ○ Facilitates broader, team-based and interdisciplinary educational models. (UPM) ○ To ensure all team-based activities are well-structured, fair, and build real-world skills. (RI)
	• **Industry Professionals:** ○ Improves networking, teamwork, and conflict resolution across academia, industry, and student cohorts. **Particularly important for inclusion:** it promotes mentorship opportunities and supports women and underrepresented groups. (SASS) ○ Strengthens capacity for cross-sectoral collaboration, vital for addressing green and digital challenges. (UPB) ○ Underpins project success, innovation cycles, and workplace inclusion through effective teamwork. (UPM) ○ To lead and contribute to diverse, high-performing teams. (RI)

Examples of Learning Outcomes

Example of UPB

Dimensions	Description
Knowledge	Explains the principles and benefits of teamwork, collaboration, and networking in creating shared value.
Skills	Works collaboratively with diverse individuals and groups to co-design and implement activities that address educational, social, or community challenges.
Responsibility and Autonomy	Builds and manages teams and partnerships effectively, demonstrating respect, inclusiveness, and shared responsibility to achieve common goals in Service-Learning or innovation projects
Learning Outcome	
By the end of this course, students will be able to collaborate effectively in diverse teams and networks to co-create innovative Service-Learning project solutions that generate shared value for communities and stakeholders	
Curricula/Course associated	
This learning outcome is addressed within the Teaching Practicum course, master's level	

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Proficiency level		
Foundation	**Intermediate**	Advanced

Example of SASS

Dimensions	Description
Knowledge	Understanding principles of teamwork, collaboration, and conflict resolution; recognizing the value of diversity, inclusion, and mutual respect in achieving shared goals.
Skills	Applying interpersonal, communication, and negotiation skills to work effectively in diverse teams; building and maintainingprofessional networks that support idea implementation.
Responsibility and Autonomy	Demonstrating empathy, respect, and responsibility in group interactions; taking initiative in facilitating collaboration and resolving disagreements; reflecting on team dynamics to enhance future cooperation.
Learning Outcome	
Collaborate effectively with others by building trust, fostering constructive communication, and resolve conflicts to achieve common objectives and create shared value.	
Curricula/Course associated	
Environmental Management	
Proficiency level	
Foundation	**Intermediate** Advanced

Example of UPM

Dimensions	Description
Knowledge	Knows principles of teamwork, inclusive leadership, and communication
Skills	Collaborates efficiently using appropriate digital tools, manages conflicts, and shares responsibilities
Responsibility and Autonomy	Leads or supports teams responsibly and facilitates productive group dynamics
Learning Outcome	
Effective engagement and leadership in team-based STEM projects with respect for diversity and shared goals	
Curricula/Course associated	
Computing Curricula 2020	
Proficiency level	
Foundation	**Intermediate** Advanced

Example of RI

Dimensions	Description
Knowledge	Knowledge of team dynamics, interdisciplinary collaboration strategies, and effective interpersonal communication.
Skills	Ability to contribute to diverse group efforts, build productive relationships, and communicate complex technical ideas to non-technical audiences.
Responsibility and Autonomy	Acts with a respectful and empathetic approach to teamwork, autonomously taking on shared responsibility for the group's success.
Learning Outcome	

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Participate as a member of a diverse team to deliver a joint presentation, including a reflection on the team's collaborative process.
Curricula/Course associated
Proje Yönetimi (Project Management)
Proficiency level

Foundation	**Intermediate**	Advanced

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3. From GREENCOMP

AREA	COMPETENCE	DESCRIPTOR
1. *Embodying sustainability values*	1.1 **Valuing sustainability**	To reflect on personal values; identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values.
	1.2 **Supporting fairness**	To support equity and justice for current and future generations and learn from previous generations for sustainability.
	1.3 **Promoting nature**	To acknowledge that humans are part of nature; and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems.
2. *Embracing complexity in sustainability*	2.1 **Systems thinking**	To approach a sustainability problem from all sides; to consider time, space and context in order to understand how elements interact within and between systems.
	2.2 **Critical thinking**	To assess information and arguments, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions.
	2.3 **Problem framing**	To formulate current or potential challenges as a sustainability problem in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems.
3. *Envisioning sustainable futures*	3.1 **Futures literacy**	To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future.
	3.2 **Adaptability**	To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk.
	3.3 **Exploratory thinking**	To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods.
4. *Acting for sustainability*	4.1 **Political agency**	To navigate the political system, identify political responsibility and accountability for unsustainable behaviour, and demand effective policies for sustainability.
	4.2 **Collective action**	To act for change in collaboration with others.
	4.3 **Individual initiative**	To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet.

Figure 5. The GreenComp conceptual reference model

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GreenComp – Area 1: Embodying sustainability values

1.2 Supporting Fairness:

To support equity and justice for current and future generations and learn from previous generations for sustainability.

Partners interested in:
UPM, UCL, RI

GreenComp Competence	Target Groups with Specific Justification
Embodying Sustainability values Supporting Fairness	• **STEAMSS Students**: ○ Promotes equity, inclusion, and social justice—critical to empowering women and disadvantaged learners to participate equitably in STEM. (UPM) ○ Builds awareness of ethical and sustainable decision-making, fostering responsible citizenship. (UCL) ○ To ensure their technical solutions (e.g., AI, urban planning) are inclusive and do not harm vulnerable communities. (RI)
	• **Educators and Academic Staff:** ○ Underpins ethical teaching and research, and ensures diverse, inclusive learning environments. (UPM) ○ Enables teachers to integrate ethics and sustainability discussions in to diverse disciplines. (UCL) ○ To create inclusive classrooms (especially for women in STEM) and use diverse, non-biased examples. (RI)
	• **Students in Career Transitions:** ○ Promotes equity, inclusion, and social justice—critical to empowering women and disadvantaged learners to participate equitably in STEM. (UPM) ○ Strengthens understanding of responsible production and consumpti on aligned with green economy skills. (UCL) ○ To be aware of the "Just Transition" principle, ensuring green policies support workers and communities equitably. (RI)
	• **HEIs Offering STEAMSS Degrees** ○ Enables the design of fair assessment systems and institutional policies; supports SDG integration. (UPM) ○ Promotes institutional responsibility and alignment with sustainability indicators. (UCL) ○ To build institutional policies that ensure equitable access to STEAMSS education for all groups (RI)
	• **Curriculum Developers:** ○ Enables the design of fair assessment systems and institutional policies; supports SDG integration. (UPM) ○ Facilitates cross-disciplinary integration of sustainability and ethics in Social Sciences and STEM. (UCL) ○ To audit all content for accessibility and ensure it represents diverse global perspectives on sustainability. (RI)

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	• **Industry Professionals:** ○ Builds positive work cultures, compliance, and market credibility; enhances team performance through diversity. (UPM) ○ Supports ethical resource management practices and CSR implementation. (UCL) ○ To develop and report on ESG (Environmental, Social, Governance) criteria, ensuring fair labor and community impact (RI)

Examples of Learning Outcomes

Example of UPM

Dimensions	**Description**	
Knowledge	Understands social justice, equity principles, and barriers in STEM	
Skills	Applies inclusive practices and equity-promoting strategies	
Responsibility and Autonomy	Advocates for fair treatment and equitable participation	
Learning Outcome		
Promoting Inclusiveness and Equity in STEM Contexts		
Curricula/Course associated		
EURO-INF		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of UCL

Dimensions	**Description**	
Knowledge	Understanding of principles of sustainable consumption, ethical resource management, and social responsibility.	
Skills	Ability to apply ethical criteria in decision-making and assess environmental and social impact.	
Responsibility and Autonomy	Acts conscientiously and models responsible behaviour in resource management and consumption.	
Learning Outcome		
Evaluate and justify ethical choices that promote sustainable resource use in business, social, or educational environments.		
Curricula/Course associated		
For the course Nutrition & Dietics		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of RI

Dimensions	**Description**
Knowledge	Knowledge of equity, inclusion, environmental justice, and social justice as fundamental components of sustainability (e.g., "Just Transition").
Skills	Ability to analyze, advocate for, and co-design fair and inclusive solutions that empower, rather than harm, vulnerable communities.

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Responsibility and Autonomy	Demonstrates a compassionate and justice-oriented approach, taking personal responsibility to challenge inequity and ensure equitable processes.

Learning Outcome
Analyze a current green policy (e.g., a new carbon tax) and write a policy brief evaluating its potential impact on low-income communities.
Curricula/Course associated
Çevre Etiği ve Adaleti (Environmental Ethics and Justice)
Proficiency level

Foundation	Intermediate	**Advanced**

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GreenComp – Area 2: Embracing Complexity in Sustainability

2.1 Systems Thinking:

To approach a sustainability problem from all sides; to consider time, space and context in order to understand how elements interact within and between systems.

Partners interested in:
UPB, UPM, RI

GreenComp Competence	Target Groups with Specific Justification
Embracing Complexity in Sustainability Systems Thinking	• **STEAMSS Students**: ○ Helps students grasp complex interdependencies between technology, society, and environment. For example, the POLITEHNICA's study highlighted that employers expect graduates in engineering to demonstrate systemic thinking and the ability to solve complex problems. The GreenScent Project developed a green competences framework and it presents a complex landscape of political, social, and economic realities to be mastered by students. (UPB) ○ Develops holistic understanding of complex challenges and the ability to analyze interconnections between technology, environment, and society. Essential for solving multidimensional problems and for interdisciplinary projects. (UPM) ○ To understand that their technical or social solutions have complex, cascading effects on the environment and society. (RI)
	• **Educators and Academic Staff:** ○ Provides teachers with a conceptual toolkit for integrating cross-disciplinary sustainability topics into existing courses, particularly in engineering and ICT. (UPB) ○ Enhances cross-disciplinary teaching and research. Empowers faculty to model and mentor comprehensive problem-solving, linking scientific, social, and environmental dimensions. (UPM) ○ To design interdisciplinary courses that break down silos between engineering, ecology, and economics. (RI)
	• **Students in Career Transitions:** ○ Supports career changers by framing new professional challenges within broader sustainability goals, making their skills transferable across sectors. (UPB) ○ Develops holistic understanding of complex challenges and the ability to analyze interconnections between technology, environment, and society. Essential for solving multidimensional problems and for interdisciplinary projects. (UPM) ○ To see the "big picture" of how different green careers connect, helping them choose a path. (RI)
	• **HEIs Offering STEAMSS Degrees** ○ Strengthens institutional capacity to respond to EU sustainability priorities while aligning with Romania's Smart Specialization Strategy, which emphasizes systemic approaches to innovation. (UPB) ○ Crucial for designing integrated programs that reflect real-world complexity and respond to societal needs. (UPM) ○ To strategically position the university as a leader in holistic, interdisciplinary education. (RI)

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	• **Curriculum Developers:** ○ Facilitates the design of curricula that bridge environmental engineering, digital innovation, and socio-economic impacts. This aligns with demands from employers in Romania for graduates able to address real-world industry-environment interactions. (UPB) ○ Crucial for designing integrated programs that reflect real-world complexity and respond to societal needs. (UPM) ○ To map and embed sustainability as a core thread across all modules, not as one isolated "green" course. (RI)
	• **Industry Professionals:** ○ Equips employees with the ability to design green innovations and optimize production processes, critical for Romania's shift toward Industry 4.0. (UPB) ○ Supports decision-making in complex, dynamic environments and ensures sustainable project development. (UPM) ○ To analyze their supply chains, products, and services for hidden sustainability risks and opportunities. (RI)

Examples of Learning Outcomes

Example of UPB

Dimensions	**Description**
Knowledge	Knows the United Nations SDGs and is aware of interconnections and possible tensions between individual goals.
Skills	Can assess interactions between environmental, economic, social, and cultural aspects of sustainability action, events and crises (e.g. migration caused by climate change or wars caused by resource scarcity).
Responsibility and Autonomy	Take responsibility for managing professional development of individuals and groups
Learning Outcome	
By the end of the course, learners will be able to consider time, space and context to analyze and address complex educational and societal challenges by: • Demonstrating understanding of the United Nations Sustainable Development Goals (SDGs), including their interconnections and potential tensions between environmental, social, economic, and cultural dimensions; • Evaluating how these interrelated systems influence educational policy, curriculum design, and learning processes; • Assessing the role and relevance of key and transformative competencies for lifelong learning, employability, and active citizenship; • Designing and justifying educational approaches that promote inclusivity, sustainability, and global responsibility within diverse learning and professional contexts. • Demonstrating ethical responsibility and a commitment to inclusive, collaborative, and transformative educational practices.	
Curricula/Course associated	
Course of Fundamentals of Education and Curriculum Theory	
Proficiency level	
Foundation	**Intermediate** Advanced

Example of UPM

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Dimensions	Description	
Knowledge	Understands complex systems theory and sustainability components	
Skills	Applies systemic analysis to evaluate impacts and relationships	
Responsibility and Autonomy	Independently synthesizes information to inform sustainable decision-making	
Learning Outcome		
Analyzing Complex Sustainable Systems Interdependencies		
Curricula/Course associated		
ABET		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of RI

Dimensions	Description	
Knowledge	Understanding of systems mapping principles, feedback loops, and the interconnections between social, technical, and ecological systems.	
Skills	Ability to use mapping tools (e.g., causal loop diagrams), analyze resource flows, and clearly communicate complex interdependencies.	
Responsibility and Autonomy	Takes responsibility for a holistic analysis, independently seeking out diverse perspectives to identify leverage points and avoid blind spots.	
Learning Outcome		
Model the interconnections of a local circular economy project (e.g., community composting) to identify key leverage points and potential unintended consequences.		
Curricula/Course associated		
Sürdürülebilir Kalkınma ve Sistem Düşüncesi (Sustainable Development and Systems Thinking)		
Proficiency level		
Foundation	Intermediate	**Advanced**

2.2 Critical Thinking:

To assess information and arguments, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions.

Partners interested in:
SASS

GreenComp Competence	Target Groups with Specific Justification
Embracing Complexity in Sustainability	• **STEAMSS Students**: ○ Helps them analyze complex sustainability problems and make evidence-based decisions, improving academic performance and employability. (SASS)
Critical Thinking	• **Educators and Academic Staff:** ○ Provides tools to teach students to question assumptions and assess evidence critically, improving teaching quality. (SASS)

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	• **Students in Career Transitions:**
	• **HEIs Offering STEAMSS Degrees**
	• **Curriculum Developers:** ○ Enables integration of inquiry-based learning and problem-oriented approaches into course design. (SASS)
	• **Industry Professionals:**

Examples of Learning Outcomes

Example of SASS

Dimensions	**Description**	
Knowledge	Understanding of environmental science, sustainability, and the interrelationship between socio-economic systems	
Skills	Ability to apply scientific reasoning, data analysis, and critical evaluation in the context of sustainability	
Responsibility and Autonomy	Capacity to independently conduct research, make reasoned judgments, and take responsibility for evidence-based conclusions	
Learning Outcome		
Analyse and evaluate the impact of various socio-economic factors on the environmentusing scientific methodology		
Curricula/Course associated		
Environmental Monitoring and Data Analysis		
Proficiency level		
Foundation	Intermediate	**Advanced**

2.3 Problem Framing:

To formulate current or potential challenges as a sustainability problem in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems.

Partners interested in:
SASS

GreenComp Competence	**Target Groups with Specific Justification**
Embracing Complexity in Sustainability Problem Framing	• **STEAMSS Students**: ○ Improves their ability to clearly define sustainability issues, a key employability skill in research, policy, and innovation roles. (SASS)
	• **Educators and Academic Staff:**
	• **Students in Career Transitions:**

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	• **HEIs Offering STEAMSS Degrees**
	• **Curriculum Developers:** ○ Supports inclusion of real-world case studies and problem-based tasks in the curriculum. (SASS)
	• **Industry Professionals:**

Examples of Learning Outcomes

Example of SASS

Dimensions	**Description**	
Knowledge	Systems thinking, sustainability science, and the nature of complex problems	
Skills	Analytical thinking, critical inquiry, and contextual analysis of multi-dimensional problems	
Responsibility and Autonomy	Analytical thinking, critical inquiry, and contextual analysis of multi-dimensional problems	
Learning Outcome		
Identify, define, and contextualize complex sustainability problems by analysing their interrelated social, economic, and environmental dimensions		
Curricula/Course associated		
Geography and Environment		
Proficiency level		
Foundation	**Intermediate**	Advanced

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GreenComp – Area 3: Envisioning Sustainable Futures

3.1 Futures Literacy:

To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future.

Partners interested in:
UPB

GreenComp Competence	Target Groups with Specific Justification
Envisioning Sustainable Futures Futures Literacy	• **STEAMSS Students**: ○ Motivates students to prepare for climate resilience and long-term innovation, addressing employer demands for strategic, future-oriented skills. The National Strategy for Adult and Continuing Education 2024-2030 specifically values green skills and futures literacy in adult education. Moreover, it proposes the inception of centers for green and digital competences testing. (UPB)
	• **Educators and Academic Staff:** ○ Provides tools for integrating foresight exercises into teaching, preparing students for uncertain futures. (UPB)
	• **Students in Career Transitions:** ○ Helps them anticipate changes in green and digital sectors, making retraining more effective. (UPB)
	• **HEIs Offering STEAMSS Degrees** ○ Strengthens partnerships with industry and community stakeholders, central to Romania's innovation ecosystems. (UPB)
	• **Curriculum Developers:** ○ Encourages embedding scenario-based learning into curricula, fostering resilience and adaptability. (UPB)
	• **Industry Professionals:** ○ Prepares professionals to co-develop sustainability solutions across sectors, essential for Romania's industrial competitiveness. (UPB)

Examples of Learning Outcomes

Example of UPB

Dimensions	Description
Knowledge	Knows that effects caused by humans play a major role when mapping alternative and preferred future scenarios
Skills	Can identify action and initiatives that lead to a preferred future
Responsibility and Autonomy	Take responsibility for managing professional development of individuals and groups
Learning Outcome	
By the end of this course, students will be able to design future-oriented educational intervention scenarios that anticipate the effects of human actions on access to education and learning deprivation, using recommendations and tools from the World Bank's RAPID framework and the	

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Early Warning Mechanism in Education (MATE), while taking responsibility for their own and their group's professional development		
Curricula/Course associated		
Course Fundamentals of Education and Curriculum Theory		
Proficiency level		
Foundation	Intermediate	**Advanced**

3.2 Adaptability:

To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk.

Partners interested in:
UPM, UCL, RI

GreenComp Competence	Target Groups with Specific Justification
Envisioning Sustainable Futures Adaptability	• **STEAMSS Students**: ○ Enables rapid adjustment to new technologies, work contexts, and societal changes. Empowers learners to thrive amidst uncertainty and evolving career landscapes. (UPM) ○ Develops systems thinking and climate awareness essential in technical programs such as Environmental Technology and Electromechanics. (UCL) ○ To develop resilience and navigate the uncertainty of climate change and new "green" technologies. (RI)
	• **Educators and Academic Staff:** ○ Facilitates innovative course delivery and adaptation to shifting student needs or institutional priorities. (UPM) ○ Provides tools to integrate climate-related challenges and resilience thinking into STEM curricula. (UCL) ○ To update their teaching methods to prepare students for jobs that may not exist yet. (RI)
	• **Students in Career Transitions:** ○ Enables rapid adjustment to new technologies, work contexts, and societal changes. Empowers learners to thrive amidst uncertainty and evolving career landscapes. (UPM) ○ Helps career changers acquire future-ready skills relevant to green jobs and sustainable engineering. (UCL) ○ To build confidence in their ability to re-skill and pivot careers in a rapidly changing job market. (RI)
	• **HEIs Offering STEAMSS Degrees** ○ Essential for keeping curricula relevant, fostering organizational resilience, and driving digital and green transitions. (UPM) ○ Aligns institutional programs with EU Green Deal and SDG priorities. (UCL) ○ To ensure the institution's long-term relevance by being responsive to environmental and economic shifts. (RI)
	• **Curriculum Developers:**

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	○ Essential for keeping curricula relevant, fostering organizational resilience, and driving digital and green transitions. (UPM) ○ Encourages embedding of climate resilience modules and interdisciplinary sustainability projects. (UCL) ○ To create flexible, modular curricula that can be updated quickly as green policies and technologies evolve. (RI)
	• **Industry Professionals:** ○ Key to personal and organizational agility, competitive advantage, and future-proofing the workforce. (UPM) ○ Supports the design of adaptation and mitigation strategies in industrial and engineering contexts. (UCL) ○ To lead change management within their companies, adapting to new regulations and resource scarcity. (RI)

Examples of Learning Outcomes

Example of UPM

Dimensions	**Description**	
Knowledge	Knows change management theories and adaptive techniques	
Skills	Applies flexible strategies to adjust plans and actions	
Responsibility and Autonomy	Takes initiative in managing change and uncertainty proactively	
Learning Outcome		
Navigating Change and Uncertainty in STEM Projects		
Curricula/Course associated		
Computing Curricula 2020		
Proficiency level		
Foundation	**Intermediate**	Advanced

Examples of Learning Outcomes

Example of UCL

Dimensions	**Description**	
Knowledge	Understanding of climate systems, environmental risks, and adaptation strategies.	
Skills	Ability to analyse climate data, anticipate environmental challenges, and apply sustainable solutions.	
Responsibility and Autonomy	Demonstrates proactive engagement and accountability in integrating resilience principles into practice.	
Learning Outcome		
Design and implement strategies that enhance climate resilience within technical, educational, or community contexts.		
Curricula/Course associated		
For the course Electromechanics modules		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of RI

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Dimensions	Description
Knowledge	Knowledge of change management principles, resilience strategies, and the inherent uncertainty of environmental and social systems.
Skills	Ability to adjust personal strategies, team plans, and behaviors in response to new information (e.g., new climate data, policy changes).
Responsibility and Autonomy	Manages personal and team responses to change constructively, autonomously reframing challenges as opportunities for innovation.
Learning Outcome	
Develop a personal resilience plan to navigate the uncertainties of the green job market, identifying skills to acquire and networks to join.	
Curricula/Course associated	
İklim Değişikliği ve Uyum (Climate Change and Adaptation)	
Proficiency level	

Foundation	**Intermediate**	Advanced

3.3 Exploratory Thinking:

To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods.

Partners interested in:
SASS, UPB, UCL

GreenComp Competence	Target Groups with Specific Justification
Envisioning Sustainable Futures Exploratory thinking	• **STEAMSS Students**: ○ Inspires them to explore innovative, future-oriented solutions and engage in research and innovation projects. (SASS) ○ Encourages critical reflection on trade-offs in sustainable development. Romanian employers have emphasized creativity and problem-solving as key graduate skills. (UPB) ○ Enhances practical skills for implementing renewable technologies and efficiency measures. (UCL) ○
	• **Educators and Academic Staff:** ○ Equips teachers with strategies to foster curiosity and creativity in students, encouraging a growth mindset. (SASS) ○ Provides methods to integrate research-based and inquiry-driven learning, enhancing pedagogy in Romanian HE. (UPB) ○ Supports integration of applied energy modules and case-based teaching. (UCL) ○
	• **Students in Career Transitions:** ○ Enables them to experiment with new ideas and adapt to emerging fields like renewable energy and green ICT. (UPB) ○ Provides reskilling opportunities for green and technical sectors. (UCL)
	• **HEIs Offering STEAMSS Degrees** ○ Positions universities as hubs of experimentation and knowledge transfer for sustainable solutions. (UPB)

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	○ Aligns research and teaching with EU sustainability and energy transition priorities. (UCL)
	• **Curriculum Developers:** ○ Encourages integration of innovation challenges, hackathons, and future-scenario activities into study programs. (SASS) ○ Supports evidence-based curriculum reform, ensuring that sustainability content is not only theoretical but also applied in context-specific scenarios. (UPB) ○ Encourages inclusion of energy management topics in STEM and business curricula. (UCL)
	• **Industry Professionals:** ○ Supports intrapreneurship by equipping staff to test innovative processes, critical in energy and ICT industries. (UPB) ○ Builds competence to optimize processes and meet environmental standards. (UCL)

Examples of Learning Outcomes

Example of UPB

Dimensions	**Description**
Knowledge	Knows about sustainability and sustainable development concepts, including origins and further developments, main stakeholders, implications for society and the planet, environmental protection, restoration and regeneration.
Skills	Can use evidence and research to better understand, explain, predict and manage change for sustainability.
Responsibility and Autonomy	Take responsibility for considering sustainability challenges and opportunities from different angles
Learning Outcome	
By the end of this course, students will be able to use research and evidence to explore and explain how educational systems can respond to sustainability challenges, and propose innovative approaches that promote environmental responsibility and social equity in learning contexts.	
Curricula/Course associated	
Course Fundamentals of Education and Curriculum Theory	
Proficiency level	
Foundation	Intermediate / Advanced

Example of SASS

Dimensions	**Description**
Knowledge	Awareness of cross-disciplinary connections and future-oriented sustainability concepts.
Skills	Creative thinking, scenario building, and design thinking applied to complex problems.
Responsibility and Autonomy	Creative thinking, scenario building, and design thinking applied to complex problems.
Learning Outcome	
Develop and propose imaginative, interdisciplinary solutions to sustainability challenges, connecting knowledge from different fields to envision possible sustainable futures	

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Curricula/Course associated		
Professional and Scientific Treatment of Environmental Issues		
Proficiency level		
Foundation	Intermediate	**Advanced**

Example of UCL

Dimensions	Description
Knowledge	Understanding of renewable energy technologies, energy systems, and efficiency measures.
Skills	Ability to design and optimise energy-efficient solutions and analyse energy performance data.
Responsibility and Autonomy	Takes responsibility for applying and advocating sustainable energy practices in professional or educational projects.
Learning Outcome	
Assess energy consumption and design renewable-energy solutions that improve efficiency in technical or organisational contexts	
Curricula/Course associated	
For the course Electromechanics	
Proficiency level	

Foundation	**Intermediate**	Advanced

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GreenComp – Area 4: Acting for sustainability

4.2 Collective Action:

To act for change in collaboration with others.

Partners interested in:
SASS, UPB, UPM, UCL, RI

GreenComp Competence	Target Groups with Specific Justification
Enabling Transformative Change Collective action	• **STEAMSS Students**: ○ Promotes teamwork and shared responsibility. Employers stressed teamwork as an essential transversal skill for graduates. (UPB) ○ Empowers learners to engage in community-driven change, collaborative projects, and shared problem-solving—amplifying impact through teamwork. (UPM) ○ Develops understanding of resource cycles and circular innovation principles. (UCL) ○ To master the collaborative skills needed for complex, multi-stakeholder projects (e.g., public-private partnerships). (RI)
	• **Educators and Academic Staff:** ○ Supports co-teaching and participatory methods, as recommended by Romanian faculty interviews. (UPB) ○ Facilitates cooperative teaching, research partnerships, and collaborative curriculum development. (UPM) ○ Facilitates teaching of circular principles across business, engineering, and design disciplines. (UCL) ○ To foster a collaborative, rather than competitive, research environment to solve large-scale problems. (RI)
	• **Students in Career Transitions:** ○ Builds teamwork and collaboration skills that ease re-entry into education and the workforce, especially in sustainability sectors. (SASS) ○ Provides opportunities to collaborate in interdisciplinary teams, easing integration into new fields. (UPB) ○ projects, and shared problem-solving—amplifying impact through teamwork. (UPM) ○ Enables reskilling towards sustainable production and waste manageme nt roles. (UCL) ○ To understand the value of networking and joining communities of practice (CoPs) for career development. (RI)
	• **HEIs Offering STEAMSS Degrees** ○ Strengthens institutional capacity for collaborative, interdisciplinary projects aligned with Steem Degrees. (SASS) ○ Strengthens partnerships with industry and community stakeholders, central to Romania's innovation ecosystems. (UPB) ○ Encourages project-based, participatory learning and institutional collaboration for sustainability goals. (UPM) ○ Supports transition towards sustainable campus management and circular procurement. (UCL) ○ To build strong partnerships with other universities, NGOs (like ours), and local government. (RI)

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	• **Curriculum Developers** ○ Encourages participatory approaches in curriculum design, embedding sustainability as a shared institutional effort. (UPB) ○ Encourages project-based, participatory learning and institutional collaboration for sustainability goals. (UPM) ○ Encourages integration of lifecycle thinking in curricula. (UCL) ○ To design group projects and assessments that mirror real-world professional collaboration. (RI)
	• **Industry Professionals:** ○ Prepares employees to participate in corporate sustainability initiatives and cross-departmental projects. (SASS) ○ Prepares professionals to co-develop sustainability solutions across sectors, essential for Romania's industrial competitiveness. (UPB) ○ Drives innovation, corporate social responsibility, and stakeholder engagement through teamwork. (UPM) ○ Encourages adoption of circular practices to improve efficiency and com pliance. (UCL) ○ To manage inter-departmental teams and build coalitions to achieve ambitious sustainability targets. (RI)

Examples of Learning Outcomes

Example of UPB

Dimensions	**Description**	
Knowledge	Knows the importance of empowering individuals and organisations to work collaboratively	
Skills	Can create transparent, inclusive and community-driven processes	
Responsibility and Autonomy	Autonomously gets involved in actions that give back to the community and nature	
Learning Outcome		
By the end of this course, students will be able to collaborate with peers and community stakeholders to design and implement service-learning initiatives that respond to local educational needs, promoting inclusive, transparent, and community-driven practices that contribute to social and environmental well-being		
Curricula/Course associated		
Course Teaching Practicum, 1st year, master's programme2		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of SASS

Dimensions	**Description**
Knowledge	Theories and frameworks related to group dynamics, participatory governance, and sustainable development.
Skills	Collaborative and communication skills required to co-create sustainability solutions with diverse groups
Responsibility and Autonomy	Ability to take shared responsibility, show initiative in group settings, and contribute ethically to collective action
Learning Outcome	

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Engage in collaborative processes with peers and stakeholders to co-design and implement sustainability-focused initiatives in local or global contexts.		
Curricula/Course associated		
Environmental Management Programmes		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of UPM

Dimensions	**Description**
Knowledge	Understands group dynamics, collaboration models, and sustainability goals
Skills	Facilitates teamwork and shared decision-making
Responsibility and Autonomy	Exhibits leadership and accountability in collective efforts
Learning Outcome	
Leading and Participating Effectively in Collaborative Sustainability Initiatives	
Curricula/Course associated	
ABET	
Proficiency level	
Foundation	**Intermediate**	Advanced

Example of UCL

Dimensions	**Description**
Knowledge	Understanding of circular economy concepts, waste-reduction strategies, and lifecycle management.
Skills	Ability to design circular processes, evaluate resource efficiency, and integrate circular practices into projects.
Responsibility and Autonomy	Promotes collaboration, innovation, and shared responsibility in advancing circular practices.
Learning Outcome	
Apply circular-economy principles to optimise material use and minimise waste in business, engineering, or educational projects.	
Curricula/Course associated	
For the course Business Management	
Proficiency level	
Foundation	**Intermediate**	Advanced

Example of RI

Dimensions	**Description**
Knowledge	Understanding of community engagement, multi-stakeholder collaboration (e.g., public-private-NGO), and shared responsibility models.
Skills	Ability to mobilize diverse groups, facilitate consensus-building discussions, and coordinate collective efforts for a common sustainability goal.
Responsibility and Autonomy	Embodies a collaborative and participatory mindset, actively taking on shared responsibility to build consensus and co-create solutions.
Learning Outcome	

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Organize and facilitate a stakeholder workshop (e.g., using a Miro board) to co-create a solution for a local environmental issue.		
Curricula/Course associated		
Sivil Toplum ve İşbirliği (Civil Society and Collaboration)		
Proficiency level		
Foundation	Intermediate	**Advanced**

4.3 Individual Initiative

To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet.

Partners interested in:
SASS, UPB, UPM, UCL, RI

GreenComp Competence	Target Groups with Specific Justification
Enabling Transformative Change Individual initiative	• **STEAMSS Students**: ○ Encourages ownership of sustainability projects and entrepreneurial activity, boosting confidence and leadership readiness. (SASS) ○ Links classroom learning to applied sustainability practices, such as pollution monitoring or energy efficiency projects. (UPB) ○ Cultivates agency, self-efficacy, and leadership. Encourages students to pursue sustainability projects, research, or entrepreneurial activities—important for talents from underrepresented groups. (UPM) ○ Encourages entrepreneurial thinking around sustainability challeng es. (UCL) ○ To empower them to act as "intrapreneurs" and "agents of change" within their future organizations. (RI)
	• **Educators and Academic Staff:** ○ Encourages embedding hands-on sustainability projects into teaching, enhancing relevance for students. (UPB) ○ Drives self-directed professional growth and teaching innovation; encourages faculty to lead new initiatives for impact. (UPM) ○ Provides a framework to teach entrepreneurship and innovation for sustainability. (UCL) ○ To encourage them to go beyond the curriculum and mentor students on personal sustainability projects. (RI)
	• **Students in Career Transitions:** ○ Provides practical tools for immediate impact in green industries. (UPB) ○ Cultivates agency, self-efficacy, and leadership. Encourages students to pursue sustainability projects, research, or entrepreneurial activities—important for talents from underrepresented groups. (UPM) ○ Helps identify and exploit sustainability-oriented business opportunities. (UCL) ○ To motivate them to proactively seek non-formal learning opportunities (like this project) to build their green skills profile. (RI)

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	• **HEIs Offering STEAMSS Degrees** ○ Supports their role in implementing sustainability policies and contributing to national goals. (UPB) ○ Supports development of leadership-focused and entrepreneurial programs; advances institutional change. (UPM) ○ Positions universities as incubators for green innovation and local partnerships. (UCL) ○ To foster a campus culture of innovation and student-led sustainability initiatives. (RI)
	• **Curriculum Developers** ○ Ensures sustainability principles are consistently integrated into program outcomes. (UPB) ○ Supports development of leadership-focused and entrepreneurial programs; advances institutional change. (UPM) ○ Supports inclusion of sustainability-driven entrepreneurship modules. (UCL) ○ To integrate project-based learning and entrepreneurial challenges that require student agency. (RI)
	• **Industry Professionals:** ○ Motivates employees to lead internal sustainability initiatives and suggest process improvements. (SASS) ○ Directly applicable to eco-innovation, regulatory compliance, and corporate social responsibility programs. (UPB) ○ Fosters a proactive mindset, innovation, and social responsibility within organizations. (UPM) ○ Encourages sustainable business model transformation and circular innovation. (UCL) ○ To identify and promote proactive employees who can lead new green initiatives and create value. (RI)

Examples of Learning Outcomes

Example of UPB

Dimensions	**Description**
Knowledge	Knows that individuals have a commitment towards society and the environment.
Skills	Can identify a network of relevant stakeholders.
Responsibility and Autonomy	Autonomously gets involved in actions that give back to the community and nature.
Learning Outcome	
By the end of this course, students will be able to identify and engage with relevant educational and community stakeholders to initiate and lead actions that promote social responsibility and environmental sustainability within their professional context.	
Curricula/Course associated	
Proficiency level	

Foundation	**Intermediate**	Advanced

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Example of SASS

Dimensions	Description	
Knowledge	Understanding of sustainability challenges, civic engagement, and principles of responsible action.	
Skills	Ability to plan, implement, and evaluate actions that contribute to sustainable development.	
Responsibility and Autonomy	Capability to act independently, make decisions, and reflect on the ethical implications of personal choices.	
Learning Outcome		
Take initiative and responsibility for planning and carrying out individual sustainability actions within personal, academic, or community environments.		
Curricula/Course associated		
Environmental Management Programme		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of UPM

Dimensions	Description	
Knowledge	Understands ethical innovation principles and self-directed learning methods	
Skills	Initiates projects and independently implements solutions	
Responsibility and Autonomy	Demonstrates ownership and ethical responsibility	
Learning Outcome		
Driving Purposeful and Ethical Innovation in STEM		
Curricula/Course associated		
EURO-INF		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of UCL

Dimensions	Description	
Knowledge	Understanding of sustainability-driven business models, innovation strategies, and circular-economy concepts.	
Skills	Ability to identify opportunities, design sustainable business solutions, and implement innovative projects.	
Responsibility and Autonomy	Demonstrates creativity, initiative, and leadership in promoting sustainability-driven entrepreneurship.	
Learning Outcome		
Develop and present sustainable innovation projects that address environmental or social challenges through entrepreneurial action.		
Curricula/Course associated		
For the course Business Management		
Proficiency level		
Foundation	**Intermediate**	Advanced

Example of RI

Dimensions	Description

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Knowledge	Understanding of personal agency, leadership models, and concrete pathways for sustainability actions (e.g., social entrepreneurship, intrapreneurship).
Skills	Ability to take proactive steps, organize resources, and lead an environmental or social project from concept to implementation.
Responsibility and Autonomy	Acts with an empowered and responsible mindset, taking autonomous initiative to drive positive change rather than waiting for instructions.

Learning Outcome
Initiate, plan, and execute a small-scale sustainability campaign (e.g., a campus waste-reduction drive) and measure its impact.
Curricula/Course associated
Sosyal Girişimcilik (Social Entrepreneurship)
Proficiency level

Foundation	**Intermediate**	Advanced

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