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CirCLER - Circular Economy Transition Manager: guiding companies of the furniture value chain to deploy their transition strategy for a more circular economy



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D4.1 Definition of CETM Joint Curricula WP4 / Task 4.1

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EFIC
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1. INTRODUCTION

The aim of the CirCLER project is to design and develop online training material for the European furniture sector to support its transition to a Circular Economy. Such a transition has grown in urgency with an identified gap of suitable personal within the sector to lead it. The project proposes an occupational profile of the Circular Economy Transition Manager (CETM).

This deliverable outlines the development of training curricula at the European Qualification Framework levels 4, 5 and 6 that a CETM and other interested personnel within the European furniture sector may complete. It was led by P3 – ATU and supported by all partners in the CirCLER project consortium.

The curriculum developed targeted two main groups:

- Vocational Education and Training (VET) and Higher Education (HE) providers;
- Employers, employees and other stakeholders interested in a CETM qualification, regardless of entering the labour market or for lifelong learning paths.

Firstly, the report presents the background to the joint curricula including the European Qualification Framework (EQF) and the results of Work Package (WP) 3. This is followed by the definition of the curricula development methodology and a detailed discussion on each of the development phases. Lastly, the final curricula is presented.

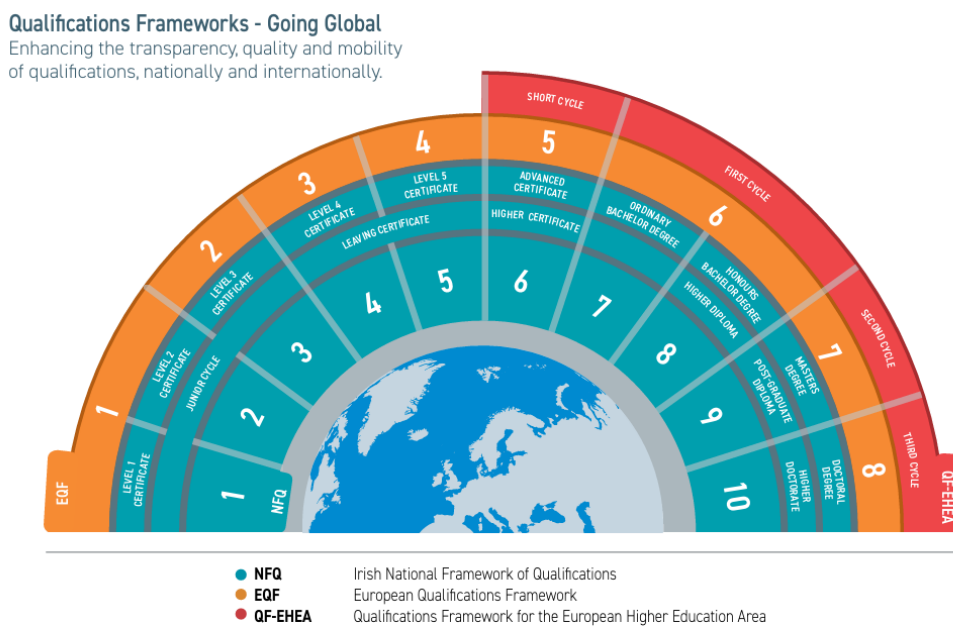
2. CETM CURRICULA BACKGROUND

Prior to the development of the CETM Curricula the following section will provide an overview of the European Framework of Qualifications and the findings from WP3 on which the CETM curricula is based.

2.2 The European Framework of Qualifications

The EQF was established in 2008 to provide a means of mapping the qualifications awarded in single European countries to qualifications awarded in the other European member states. This allows individuals to obtain qualifications in one country and build on them in educational organisations in other European countries. Also, the framework enables workers to easily move between countries and secure employment at a level aligned with their programme of study regardless of their country of origin in Europe. Other countries outside the European Union have also signed up to the framework e.g. Iceland, Liechtenstein, Norway, Albania, Switzerland (Europass, n.d.).

The EQF sets out 8 qualification levels with level 1 assigned to the lowest level and level 8 assigned to the highest level of study. Each level is defined according to the knowledge, skills and responsibility/autonomy descriptors the learner must demonstrate upon completion of that level of study. These descriptors are collectively known as learning outcomes. For example, level 1 knowledge requires the learner to demonstrate basic general knowledge, basic skills required to carry out simple tasks and to work or study under direct supervision in a structured context. National qualification frameworks are mapped to the EQF to create transparency and comparability for employers, workers and learners alike. The mapping of the Irish National Framework of Qualifications against the EQF can be seen in figure 1 below.



For further information consult: www.QQI.ie

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Figure 1: Irish National Qualification Framework and EQF mapping (QQI, 2024)

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The EQF levels are illustrated in orange, while the Irish National Qualification Framework levels are illustrated in green. For example, the EQF level 5 is equivalent to the Irish National Qualification Framework level 6 Higher Certificate. Similar mappings exist for other member states.

The CETM curricula to be developed for the CirCLER project will be at the EQF levels 4, 5 and 6. Level 4 EQF learning outcomes are shown in Table 1.

Table 1: EQF level 4 learning outcomes (Europass, n.d.)

— Level 5 - learning outcomes		
Knowledge	Skills	Responsibility and autonomy
Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	Exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others

Level 5 EQF learning outcomes are show in Table 2.

Table 2: EQF level 5 learning outcomes (Europass, n.d.)

— Level 5 - learning outcomes		
Knowledge	Skills	Responsibility and autonomy
Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	Exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others

Level 6 EQF learning outcomes are show in Table 3.

Table 3: EQF level 6 learning outcomes (Europass, n.d.)

— Level 6 - learning outcomes		
Knowledge	Skills	Responsibility and autonomy
Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts; take responsibility for managing professional development of individuals and groups

These learning outcomes will guide the development of the CETM curricula.

2.3 Work package three results

The third work package of the CirCLER project conducted a skills gaps and needs analysis for circular transition managers for the EU furniture sector. The aim of the analysis was to identify and validate the skills and knowledge requirements for a CETM manager. A survey of experts in the field and an experts workshop provided the raw data for this skills gaps and needs analysis.

A CETM competencies framework developed based on a literature review guided the survey and workshop questions. The framework addresses the perceived knowledge, skills and competency gaps of professionals with the EU furniture industry namely Values Thinking, Inter Personal Thinking, Systems Thinking, Strategic Thinking, Operational Thinking and Futures Thinking. See Figure 2.

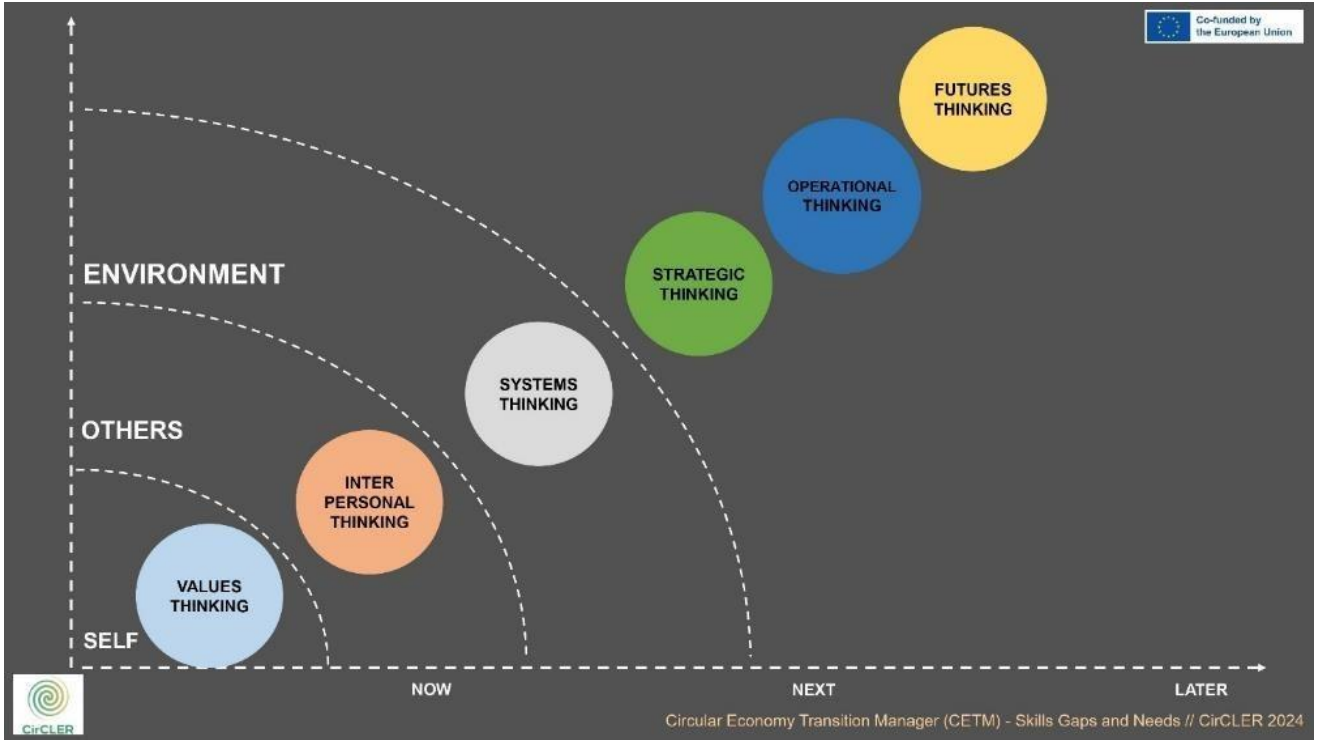


Figure 2: CETM knowledge, skills and competency needs

These gaps were then broken down into specific areas to form a competency framework for the CETM as illustrated in Figure 3.

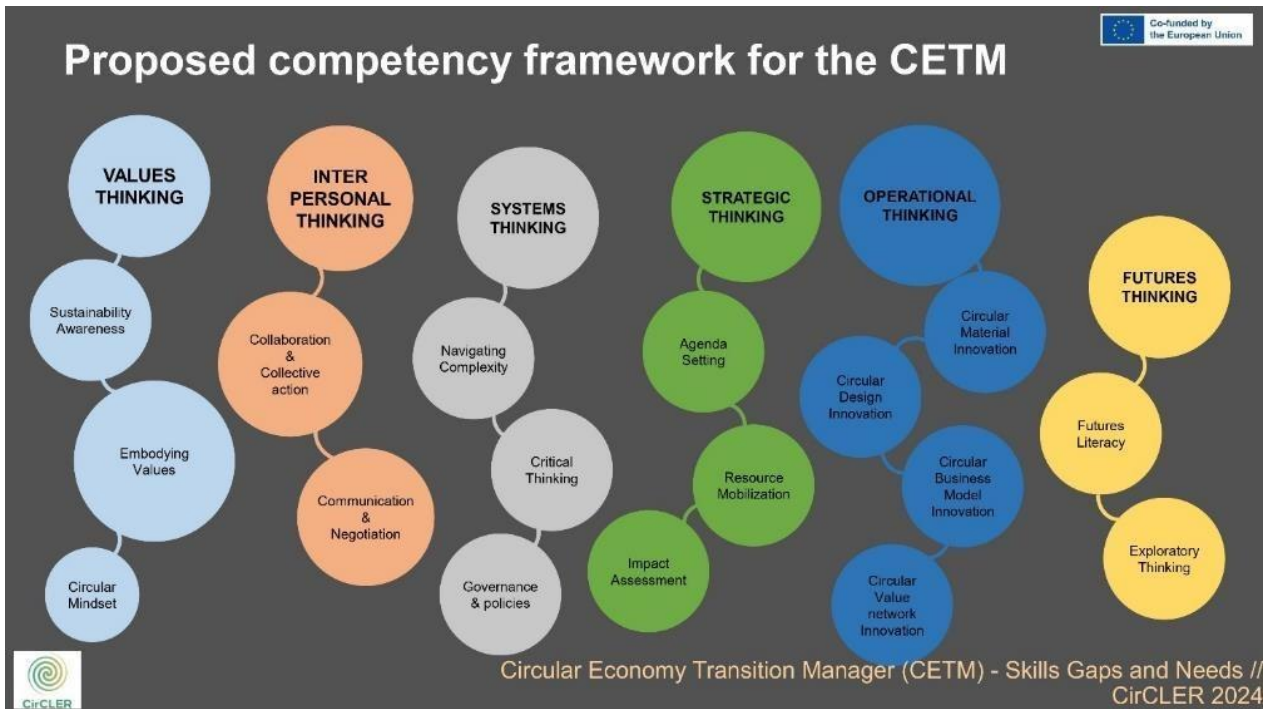


Figure 3: CETM competencies framework

The results of the survey and experts workshop confirmed the gaps and competencies identified in the CETM competency framework need to be met in order for the EU furniture sector to transition successfully to the circular economy. Additionally, the structure presented was deemed appropriate. A detailed discussion on the findings of *D3.1 CE transition manager KSC needs* may be found in the D3.1 report. Summary extracts from that report include:

Importance

Skills and competencies following under all macro areas and sub-areas of the framework are considered very important (with all values above eight) to support the CETM to understand and properly guide the companies along the design and implementation of challenging circular economy strategies. No area has been identified as one that cannot contribute to this successful design and implementation.

Proficiency

Results about the existing proficiency in all these areas looks acceptable but clear possibilities for improvement and enhancement are confirmed in all areas. Maybe it is worth to note that the in the sub-area of Future literacy (macro area Future Thinking) we can find the only value below 5, with a value of 4,70 and that in the sub-area of Circular material innovation (macro area of Operational Thinking) we find a high proficiency level of 7,55, the highest value of the whole survey under this proficiency section.

Current Training Offer

An overall analysis of the results of the Current Training Offer shows that the averages of the results are quite low, in the majority of the cases just acceptable (above an average of five), but none of them reach really satisfactory values. The highest value is 6,01 in the

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sub-area of Sustainability Awareness within the area of Values Thinking. It is worth to note that the in the sub-area of Future literacy we can find the only value below 4, with a value of 3,78. All of this clearly shows there is an urgent and strong need of increasing the existing training offer in all the areas covered by the CirCLER competencies framework.

Dialogue and open questions identified requirements for the CETM curricula:

- Digital and technical skills
- Transversal/soft skills
- Communication skills
- Techniques and instruments
- Regulations and legislation directly linked to circularity within the EU furniture sector
- Product materials, production processes and end of life
- Transition strategies

The combination of EQF levels and WP3 outputs informed the development of the CETM curricula.

3. CURRICULA DEVELOPMENT METHODOLOGY

The methodology for the development of the CETM Curricula is made up of 4 phases as illustrated in Figure 4.

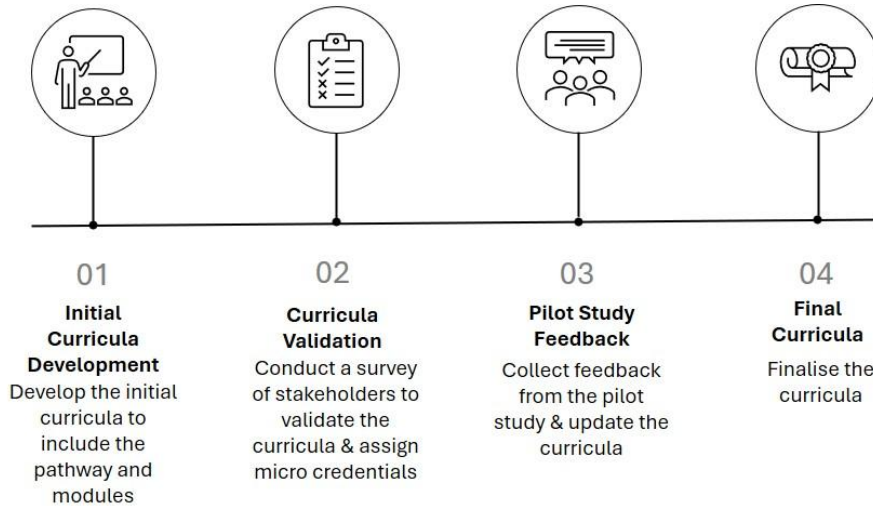


Figure 4: CETM curricula development methodology

Phase 1 Initial Curricula Development: The initial curricula developed includes the level 4,5 and 6 learner pathways, the module names, topics, pills, learning outcomes, duration, and the mapping of the competencies to the modules and the pre requisites.

Phase 2 Curricula Validation: Through the use of a survey with stakeholders the curricula was validated and updates made. Micro credentials were mapped to the curricula.

Phase 3 Pilot Study Feedback: Following the development of a training toolkit to deliver the CETM curricula an extensive pilot study was implemented and feedback gathered. This feedback was used to update the curricula.

Phase 4 Final Curricula: The CETM curricula is finalised and documented.

Each of the above phases are detailed in the next sections of the report.

4. PHASE 1: INITIAL CURRICULA DEVELOPMENT

Phase 1 of the curricula development took place between September 2024 and February 2025. Partners who contributed to the development of the curricula included AMBIT, FLA, UVA, POLIMI, UNFU, UniTBv, KIT, ATU, and CETM. The initial curricula was developed over multiple iterations through extensive dialogue and discussion.

In order to provide the learners with a scaffolded approach to build their CETM competencies a learning pathway was defined. This pathway illustrated in Figure 5 is divided into three stages namely; Junior CETM, Intermediate CETM and Advanced CETM.

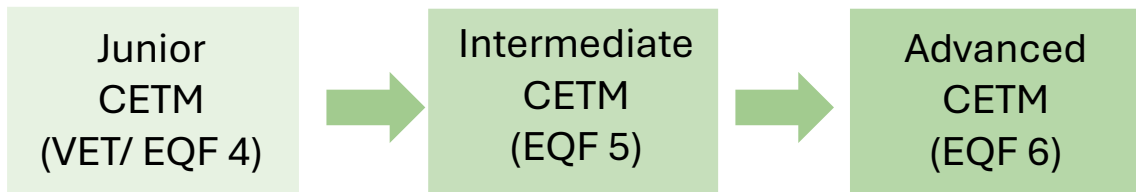


Figure 5: CETM learner pathway

Each stage aligned with an EQF level as can be seen in Figure 5. Using the self-assessment tool developed by the project the learner would be able to determine what stage their current competencies aligned with and what stage they want to work towards. E.g. a learners competencies may be Intermediate and they want to improve it to the Advanced CETM stage.

A set of modules and their order were identified and agreed that met the three learning pathways as shown in Table 4 below.

Table 4: CETM curricula modules

MODULE #	MODULE NAME
1	Circular Economy Introduction
2	Legislative Instruments
3	Voluntary Instruments
4	Circular Business Models
5	Circular Design
6	New and Sustainable Materials
7	Key Enabling Technologies
8	Manufacturing Processes
9	Circler Economy Transition Strategy
10	Closing

Module learning outcomes and pills for each module were then developed. An example of the Learning Outcomes (LOs) and pills for module 1 *Circular Economy Introduction* is shown in Table 5 below.

Table 5: CETM initial curricula *Circler Economy Introduction* module learning outcomes and pills

MOD #	MODULE NAME	LEARNING OUTCOME	PILL #	PILL TITLE	PILL TOPICS	PILL DURATION (HOURS)
1	Circular Economy Introduction	LO1: To understand the urgency related to environmental issues	1	Context - State of the art	1. Environmental pressures: climate change, biodiversity loss, resource depletion 2. Impacts and role of the furniture industry in environmental degradation	0.2
		LO2: To develop an understanding on how responses to impact (e.g. climate) issues are being framed at global level	2	Current global responses	1. Sustainable development definitions 2. Sustainable frameworks: SDGS, planetary boundaries, doughnut economics	0.2
		LO3: To recognize the potential alternative to linear economy	3	Introduction to the Circular Economy	1. Circular Economy as a strategy to reach sustainability 2. Circular Economy definition and general principles (circular products and materials, regenerate + butterfly model)	0.2
		LO4: To understand the benefits related to Circular Economy	4	Benefits of circular approaches	1. Environmental benefits 2. Economic benefits 3. Social benefits	0.2
		LO5: To recognize the role of transition manager as an active orchestrator of the transition	5	CETM - Profile outline	1. The role of the Circular Economy Transition Manager (CETM) 2. Introducing the key competence areas of the CETM	0.2

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The initial curricula included 57 learning outcomes and 52 pills to be delivered over 71 training hours.

Pre-requisite modules and the relevant LOs were also identified as part of the initial curricula. Table 6 illustrates the full set of pre-requisite modules and relevant LOs for the initial curricula.

Table 6: CETM curricula pre-requisite modules and relevant LOs

MOD #	MODULE NAME	PRE-REQUISITE MODULES & RELEVANT LO(S)
1	Circular Economy Introduction	None
2	Legislative Instruments	Circular Economy Introduction: all LOs
3	Voluntary Instruments	Circular Economy Introduction: all LOs Legislative Instruments: all LOs
4	Circular Business Models	Circular Economy Introduction: all LOs
5	Circular Design	Circular Economy Introduction: all LOs Legislative Instruments: LO3 - LO4 Voluntary Instruments: LO1 - LO3
6	New and Sustainable Materials	Circular Economy Introduction: all LOs Legislative instruments: all LOs Voluntary instruments: LO3 Circular Design: LO3 & LO6 Manufacturing Processes: LO3 Circular Economy Transition Strategy: LO1
7	Key Enabling Technologies	Circular Economy Introduction: all LOs Circular Business Models Module: LO1 Circular Design Module: LO3
8	Manufacturing Processes	Circular Economy Introduction: all LOs Circular Business Models Module: LO2 Key Enabling Technologies module: LO3 & LO6 Circular Design: LO3 New & Sustainable Materials: LO4
9	Circular Economy Transition Strategy	Circular Economy Introduction: all LOs Legislative instruments: LO3 Voluntary instruments: LO1 - LO3 Circular business model: LO1, LO3 Circular design: LO1, LO3 Key Enabling Technologies: LO5 Manufacturing Processes: LO1-LO3
10	Closing	All modules: all LOs

Lastly, the CETM competencies framework developed and validated in WP3 was mapped to the CETM curricula. This included the competency areas of Values Thinking, Inter Personal Thinking, Systems Thinking, Strategic Thinking, Operational Thinking and Futures Thinking. An example of the mapping of the competencies framework for module 3 *Voluntary Instruments* is shown in Table 7 below.

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Table 7: CETM competencies framework mapping to the initial *Voluntary Instruments* module

MOD #	MODULE NAME	PILL #	PILL TITLE	COMPETENCY AREAS	COMPETENCIES
3	Voluntary Instruments	1	Environmental attributes in furniture companies and certifications and voluntary environmental instruments to communicate them	<ul style="list-style-type: none"> 1. Values Thinking 2. Interpersonal Thinking 3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking 	<ul style="list-style-type: none"> 1.3 Circular Mindset 2.2 Communication & Navigation 3.1 Navigating Complexity 3.2 Critical Thinking 4.1 Agenda Setting 5.2 Circular Design Innovation
		2	Certifications and voluntary environmental instruments applicable at company level	<ul style="list-style-type: none"> 1. Values Thinking 2. Interpersonal Thinking 3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking 	<ul style="list-style-type: none"> 1.3 Circular Mindset 2.2 Communication & Navigation 3.2 Critical Thinking 4.3 Circular Impact Assessment 5.3 Circular Business Model Innovation
		3	Certifications and voluntary environmental instruments applicable at product level	<ul style="list-style-type: none"> 1. Values Thinking 2. Interpersonal Thinking 3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking 	<ul style="list-style-type: none"> 1.3 Circular Mindset 2.2 Communication & Navigation 3.2 Critical Thinking 4.3 Circular Impact Assessment 5.2 Circular Design Innovation
		4	Alignment with my clients' certifications and voluntary environmental instruments	<ul style="list-style-type: none"> 1. Values Thinking 2. Interpersonal Thinking 3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking 	<ul style="list-style-type: none"> 1.3 Circular Mindset 2.2 Communication & Navigation 3.2 Critical Thinking 5.4 Circular Value Network Innovation

With the initial CETM curricula developed the next phase involved validating the curricula.

5. PHASE 2: CURRICULA VALIDATION

Phase 2 of the curricula development took place between February 2025 and September 2025. Partners who contributed to the validation of the curricula included AMBIT, FLA, UVA, POLIMI, UNFU, UniTBv, KIT, ATU, and CETM.

Curricula validation involved several steps to ensure that the Curricula was as relevant as possible. The aim of the validation was:

- To identify areas of overlap within the curriculum and rectify
- To ensure that the content of the curriculum was relevant to the furniture industry
- To ensure that the curriculum content accurately reflected the direction of the furniture industry.

5.1 Overlaps within the Curriculum

During the initial development of the curriculum, partners added topics to the pills within their assigned modules. As such, when the partners met to discuss initial curriculum development, these topics were addressed. A number of overlaps were identified, as outlined below.

New and Sustainable Materials

- Pill 9 *R&D techniques for new products* overlapped with Circular Design module contents.

Circular Business Models

- *Product Service Systems* pill overlapped with content in Circular design module.

Manufacturing Processes

- Some contents in Pill 1 and Pill 4 overlapped with content within the Circular Design module.

Circular Economy Transition Strategy

- Some content overlapped with the Circular Economy Introduction, Circular Business Models, and Circular Design Modules

In order to eliminate these overlaps, a number of meetings were held between the partners involved in the development of the pills to ensure that topics were discussed in the correct context. In all cases, this was achieved. Partners either conceded that the topic was more appropriate in another module, or they split the topic into different categories. An example of this would be in the Manufacturing processes module. Life Cycle Assessment (LCA) was seen as an important topic for both this module and the Circular Design Module. As such, after discussion between partners, Manufacturing Processes discussed LCA in the context of measuring emissions from manufacture, while the Circular Design module discussed the application of LCA as a tool for the design of furniture.

In this way, all overlaps were eliminated and the curriculum could be presented to outside bodies for validation.

5.2 Curriculum Validation: Outside Bodies

In order to achieve the final aims of the validation process, active members of the furniture industry were contacted to gauge their reaction to the curriculum. T4.3 involved going to businesses within the furniture industry and asking their opinion of the Curriculum, in terms of content, relevance and how understandable the curriculum was.

The questions asked in the survey are included in the annex. The survey was answered by 49 respondents, all of whom were considered experts in the furniture industry.

Overall, the results were very positive, with experts being very happy with the resource. However, there were a number of small areas that were recommended for improvement. These are highlighted in Table 8 below.

Table 8: CETM curricula improvement recommendations

ECONOMIC, FINANCIAL AND SOCIAL ASPECTS COULD BE IMPROVED	
Highlight non-sustainable examples (materials and bad practices) that have been or are still being used but are not environmentally friendly.	a. For instance, in the *Adhesives and Coatings* module, it could be beneficial to emphasise the negative aspects of coatings that are now banned or are used only in specific cases where economic factors take precedence—such as creosote oil.
	b. This broader perspective would be particularly relevant for higher education levels (EQF6).
	c. This might be already covered in some modules and it is not specifically emphasised.
Consumer Engagement & Behaviour	a. Emphasize consumer education, co-creation, and behavioural change strategies.
	b. Include strategies for promoting product-as-a-service models and incentivizing consumer participation in take-back schemes.
	c. Address barriers like consumer awareness and behaviour.
	d. Highlight the role of consumers in the circular economy.
	e. "There's a brief mention of "Communicating Circular Value to Customers", but a more robust exploration of consumer education, co-creation, and behavioural change strategies could bridge the gap between producers and end-users. Examples: Strategies for promoting product-as-a-service models or incentivizing consumers to participate in take-back schemes".
Emerging trends and Innovations	a. Add a module on emerging materials, business models, and production techniques.
	b. Integrate future trends and innovations.
	c. Include Generative AI (GenAI) in finding circular solutions.
Sustainability and Compliance	a. Integrate Environmental, Social, and Governance concepts.
	b. Consider international sustainability and compliance requirements, not just EU regulations.
	c. Discuss sustainable purchasing and value chain collaboration.
	d. Address the regulatory directions of the digital passport of the product.
Practical Skills and Case Studies	a. Include practical case studies and success stories from SMEs.
	b. Expand on Life Cycle Assessment methodology with practical examples.
	c. Introduce a dedicated module on applying Life Cycle Assessment software tools.
	d. Cover specific materials design techniques and 3D design and modelling software.
	e. Address logistics and waste management.

5.3 Curricula Changes

As a result of the feedback on the Curriculum, a new document was finalised on 24th April 2025 to reflect the changes recommended during validation.

No significant changes were made to the curriculum as a result of the validation, but some content was added to the pills, as suggested by outside bodies. This iteration of the curriculum also resulted in the addition of micro credentials for each pill. These micro credentials were mapped to the curriculum by the partners for each module, as shown in Table 9 below.

Table 9: CETM micro credentials mapped to the *Circular Design* module

MOD #	MODULE NAME	PILL #	PILL TITLE	MICRO CREDENTIAL TITLE	MICRO CREDENTIAL DESCRIPTION
5	Circular Design	1	Introduction to Circular Design for Furniture	Foundations of Circular Design in the Furniture Industry	This micro credential certifies foundational knowledge of Circular Design principles and the critical role of design and designers in driving sustainability within the furniture industry. Learners will explore key concepts of Circular Design, while examining how design choices influence environmental impact, material use, and industry policies. With a focus on circular mindset, governance, and policy, this certification provides essential knowledge for professionals looking to integrate sustainable design strategies into the evolving landscape of the furniture sector.
		2	From Green to Circular Design: The Evolution of Design for Sustainability in the Furniture Sector	Evolution of Circular Design in the Furniture Sector	This micro credential provides insights into the historical development of Circular Design within the furniture industry. Learners will explore key milestones, influential case studies, and significant events that have shaped the discipline over time. By examining the intersection of Circular Design principles and the furniture sector, participants will gain a deeper understanding of its evolution and the factors driving sustainable innovation in design.
		3	Life Cycle Thinking	Life Cycle Thinking in Furniture Design	This micro credential equips learners with the knowledge to assess and manage the environmental impact of furniture products throughout their life cycle. Participants will explore Life Cycle Assessment (LCA) and Product Environmental Footprint (PEF) methodologies, linking them to manufacturing processes. Through case studies, they will analyse Environmental Product Declarations (EPD) and understand how Life Cycle Design (LCD) fosters a circular mindset. This certification provides a foundational approach to prioritizing sustainable strategies in product development.
		4	Strategies of Design for Circular Furniture	Design Strategies for Circular Furniture	This micro credential certifies expertise in integrating circular economy principles into furniture design to minimize environmental impact. Learners will explore key strategies, including optimizing product use and manufacturing (Refuse, Rethink, Reduce), extending product lifespan (Reuse, Repair, Refurbish, Remanufacture, Repurpose), and ensuring effective material applications (Recycle, Recover). Through practical insights, this certification empowers professionals to create sustainable, long-lasting, and resource-efficient furniture solutions.
		5	Design mindset for low-impact manufacturing and material choices	Design Mindset for Sustainable Manufacturing and Material Choices	This micro credential certifies knowledge of sustainable decision-making in the design process, focusing on material and manufacturing choices that align with circular economy principles. Learners will explore how material selection and production technologies impact environmental sustainability and product lifecycle. Through a designer's perspective, this certification provides essential insights into creating low-impact furniture by integrating circular design strategies and responsible resource use.
		6	Methodology for the Circular Designer	Methodology for Circular Furniture Design	This micro credential certifies knowledge of the practical application of circular design methodologies in the furniture sector. Learners will gain hands-on experience in integrating circular economy principles, utilizing tools, and applying theoretical concepts to real-world projects. This certification equips professionals with a structured approach to designing sustainable furniture, ensuring efficient material use, extended product lifespan, and alignment with circular economy strategies.

6. PHASE 3: PILOT STUDY FEEDBACK

Phase 3 of the curricula development took place between October 2025 and March 2026. The pilot study, and the subsequent monitoring of the curriculum involved all partners. The aim of the pilot study was to ensure that the training toolkit, the online course and the curriculum all fulfilled the learners needs in a real-world setting.

The training toolkit was developed by all partners based on the work they had carried out in the development of modules for the curriculum. The training toolkit consisted of scripts for videos and podcasts, that were then posted on the platform after being developed. These were then consolidated into an online platform that hosted the curriculum for learners.

6.1 Pilot study methodology

The pilot study took place between October 2025 and March 2026. During the pilot study, 856 learners were registered across the 7 languages that the course was offered in, as shown in Table 10 below.

Table 10: CETM curricula improvement recommendations

LANGUAGE	REGISTERED LEARNERS
English	191
German	31
Italian	177
Romanian	138
Slovenian	17
Spanish	228
Ukrainian	74

Students registered for the course, chose a level, and accessed content as if the course were live and worked their way through a module of their own choosing. Students were free to complete more modules if they desired. Learners were encouraged to interact with the platform and were supported by the Mentors club, a panel of experts who were tasked with assisting learners with any queries they had concerning the platform.

6.2 Feedback from Pilot study and Curricula Changes

Both learners and mentors filled out surveys to assess the training toolkit, the online platform and the curriculum.

Of the three categories, the Curriculum content was judged to be the most satisfactory, with an average score of 3.98/5. Learners had no suggested changes to the content that would have a bearing on the Curriculum. However, they did express a desire for more real world examples of circularity in furniture.

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Tutors also participated in a survey, commenting positively on the content of the course, but pointing out the need for real world examples and identifying social context as a missing element.

A summary of the curricula actions taken in response to the pilot study feedback are shown in Table 11 below.

Table 11: CETM curricula pilot study feedback responses

ACTION	SOLUTION	IMPLEMENTED
Integrate some real-life case studies	Partners to assess where this content can be added and make suggestion.	Yes
Update content with digitalisation and AI topics	Partners to assess where this content can be added and make suggestion.	To be implemented post project

7. FINAL CURRICULA

Phase 4 of the curricula development took place between April 2026 and June 2026. Having assessed the content of the curriculum rigorously, within the partnership, with the aid of outside experts in the furniture industry and with the feedback provided by learners, the curricula was finalised. The final version is made up of three curriculum namely; Junior CETM, Intermediate CETM and the Advanced CETM. Transitioning between the three curricula and the pills to be completed are illustrated in Figure 6 below.

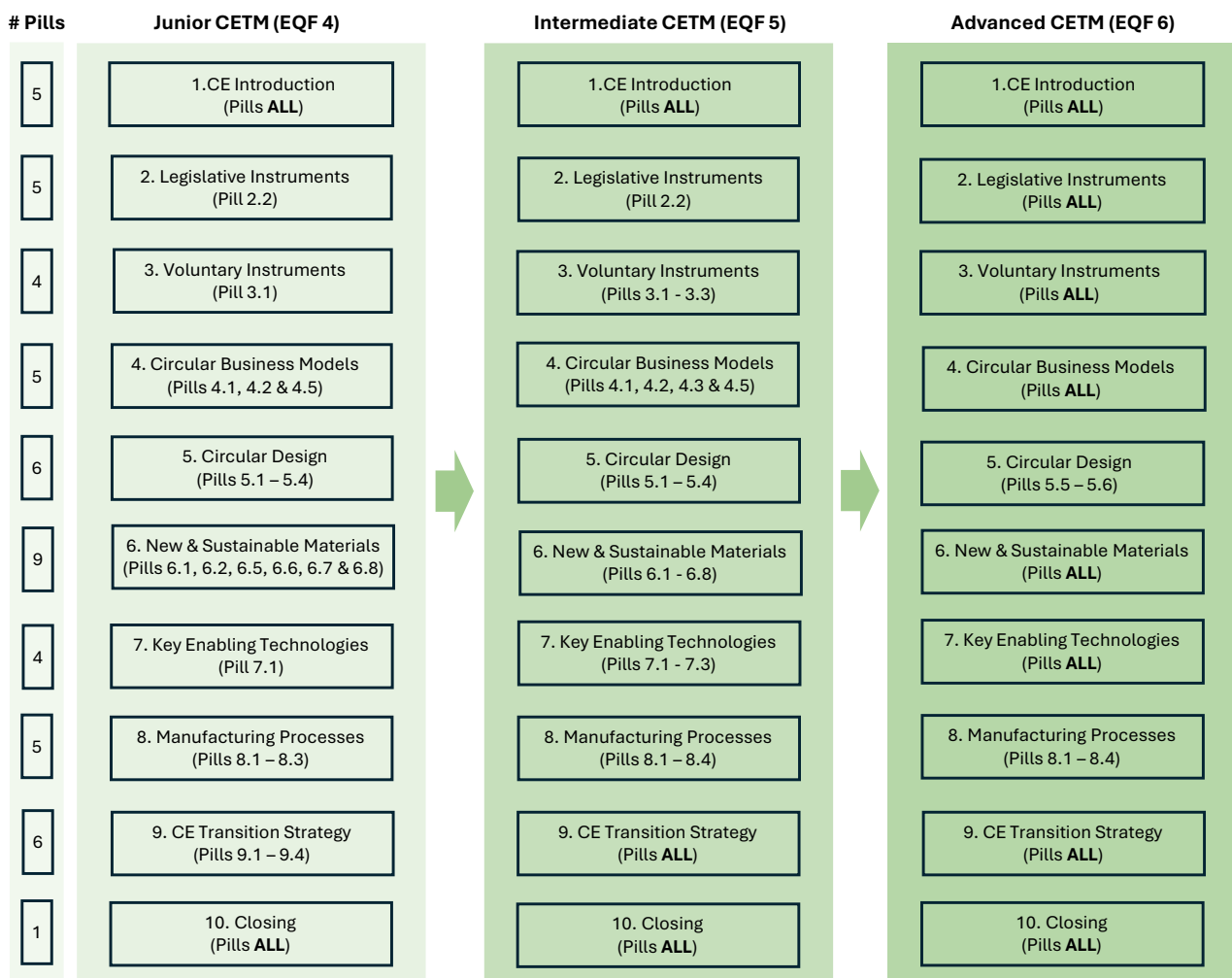


Figure 6: Final CETM curricula

The modules included in the initial version of the curricula did not change over the development of the curricula. A list of the modules may be found in Table 4.

Over the duration of the curricula development process minor changes were made to the LOs, pills, pill topics and training commitment requirements. An example of the final LOs, pills, topics and training commitment required for module 2 *Legislative Instruments* can be seen in Table 12. A full set of information for all ten of the modules may be found in Annex 2.

Table 12: CETM final curricula *Legislative Instruments* module information and training commitment

MOD #	MODULE NAME	PILL #	PILL TITLE	LEARNING OUTCOME	PILL TOPICS	COURSE DURATION (HOURS)	PROJECT DURATION (HOURS)	TOTAL DURATION (HOURS)
2	Legislative Instruments	2.1	Corporate Sustainability Reporting Directive and Taxonomy Framework	LO1: To learn the goals, key principles and application rules of the Corporate Sustainability Reporting Directive and the Taxonomy Regulation Framework.	1. CSRD regulation 2. Description of the Taxonomy Regulation 3. Case studies	1.75	0.75	2.50
		2.2	Ecodesign for Sustainable Products Regulation (ESPR)	LO2: To learn the key principles and application rules of the European Ecodesign regulation.	1. Description of the ESPR regulation 2. Recommendation for furniture companies 3. GPP and Ecolabel criteria 4. Case studies	3.75	0.75	4.50
		2.3	From the Waste Regulation to the right to repair	LO3: To learn the regulation about Extended Producers Responsibility, waste and the consumers' right to repair.	1. Waste Framework Directive 2. Packaging and Packaging Waste Directive 3. Right to repair	2.00	0.50	2.50
		2.4	EU Deforestation Regulation	LO4: To learn the key principles and application rules of the EUDR regulation economy	1. Description of the EUDR regulation 2. Compliance solution for companies along the timber-furniture value chain	2.00	0.50	2.50
		2.5	Chemicals of Furniture Products	LO5: To learn the main legislative regulations for chemicals in the furniture sector.	1. REACH and relevant general chemical regulations 2. Formaldehyde restrictions and alternatives 3. Melamine status 4. VOC regulations 5. Wood Treatments and Preservatives 6. Flame Retardants 7. Green Chemistry 8 Case studies	2.00	0.50	2.50

D4.1 Definition of CETM Joint Curricula Report

The final curricula includes 58 learning outcomes and 50 pills to be delivered over 150 training hours. Table 13 illustrates the breakdown of training hours per the level 4,5 and 6 curriculum.

Table 13: CETM curricula training commitment

JUNIOR CETM (EQF 4)			INTERMEDIATE CETM (EQF 5)			ADVANCED CETM (EQF 6)		
COURSE (H)	PROJECT (H)	TOTAL (H)	COURSE (H)	PROJECT (H)	TOTAL (H)	COURSE (H)	PROJECT (H)	TOTAL (H)
70.25	13.75	84	97.25	18.75	116	125	25	150

The pre-requisite modules and relevant LOs included in the initial version of the curricula did not change over the development of the curricula. A list of the final pre-requisite modules and relevant LOs for the CETM curricula may be found in Table 6.

Over the duration of the curricula development process minor changes were made to some of the competencies mapped to the module pills. An example of the final competencies required for module 2 *Legislative Instruments* can be seen in Table 7. Note there were no changes required for this module. A full set of competency information for all ten of the CETM modules may be found in Annex 3.

The micro credentials introduced during phase 2 of the curricula development process did not change. A full set of CETM micro credentials mapped to the CETM curricula may be found in Annex 4.

The final curricula are detailed in the MS Excel spreadsheet entitled: D4.1_FINAL Curriculum_ATU_22_JUNE_2026.xlsx

8. CONCLUSIONS

Having created the curricula based on EQF standards and industry needs, conversed and worked with partners on development and validated the curricula based on feedback from outside stakeholders, Circlers partners and learners, the final curricula has been successfully delivered. The curricula meets the requirements of CETMs in the EU furniture sector.

The curriculum was developed through several iterations, growing from a list of modules to a structured set of pills that broke down topics into manageable portions for learners. This was further developed, in consultation with partners, to include post and pre requisites, competency areas, and divisions into EQF levels 4,5 and 6. This consideration as to the needs of the learner speaks for itself when considering the satisfaction level of the learners in the final feedback on the pilot study.

With the finalisation of the curricula, the CETM platform has a solid base from which to deliver content to learners.

REFERENCES

Quality and Qualifications Ireland, (2024), Qualifications Frameworks – Going Global, retrieved 9th June 2026 from https://www.qqi.ie/sites/default/files/2024-07/qqiglobalfansphere_2024.pdf.

Europass, (n.d.), The European Qualifications Framework, retrieved 9th June 2026 from <https://europass.europa.eu/en/european-qualifications-framework-efq>.

Annex 1

Survey question from T4.3

1. How relevant is the new curricula for the furniture industry circular transition?	Score 1-10
Please describe your rating.	
2. Are there any topics you consider are missing or could be improved in the proposed curricula?	Yes, No
If YES, please share your opinion.	
3. What are the main strengths of the proposed Curricula? Please describe, if any.	
1. How relevant is the proposed training methodology for the furniture industry circular transition?	Score 1-10
Please describe your rating.	
2. Are there any parts you consider are missing or could be improved in the proposed training methodology?	Yes, No
If YES, please share your opinion.	
3. How flexible do you think is the proposed training methodology for different learning styles?	Score 1-10
Please describe your rating.	
1. How satisfied are you with the overall content of the proposed Curricula and Training methodology?	Score 1-10
Please describe your rating.	

Annex 2

CETM final curricula *Circular Economy Introduction* module information and training commitment

MOD #	MODULE NAME	PILL #	PILL TITLE	LEARNING OUTCOME	PILL TOPICS	COURSE DURATION (HOURS)	PROJECT DURATION (HOURS)	TOTAL DURATION (HOURS)
1	Circular Economy Introduction	1.1	The urgency of change: rethinking industry and sustainability	LO1: To understand the urgency related to environmental issues.	1. Environmental pressures: climate change, biodiversity loss, resource depletion... 2. Impacts and role of the furniture industry in environmental degradation	0.4	0.00	0.4
		1.2	Sustainable development & global frameworks: rethinking Industry for a resilient future	LO2: To develop an understanding on how responses to impact (e.g. climate) issues are being framed at global level.	1. Sustainable development definitions 2. Sustainable frameworks: SDGS, planetary boundaries, doughnut economics	0.4	0.00	0.4
		1.3	Circular Economy: rethinking waste, resources, and industry	LO3: To recognize the potential alternative to linear economy.	1. Circular Economy as a strategy to reach sustainability 2. Circular Economy definition and general principles (circular products and materials, regenerate + butterfly model)	0.4	0.00	0.4
		1.4	The Circular Economy: a win for the planet, business, and society	LO4: To understand the benefits related to Circular Economy.	1. Environmental benefits 2. Economic benefits 3. Social benefits	0.4	0.00	0.4
		1.5	The role of the Circular Economy Transition Manager: leading the change in the furniture industry	LO5: To recognize the role of transition manager as an active orchestrator of the transition.	1. The role of the Circular Economy Transition Manager (CETM) 2. Introducing the key competence areas of the CETM 5. Wood Treatments and Preservatives	0.4	0.00	0.4

D4.1 Definition of CETM Joint Curricula Report

CETM final curricula *Legislative Instruments* module information and training commitment

MOD #	MODULE NAME	PILL #	PILL TITLE	LEARNING OUTCOME	PILL TOPICS	COURSE DURATION (HOURS)	PROJECT DURATION (HOURS)	TOTAL DURATION (HOURS)
2	Legislative Instruments	2.1	Corporate Sustainability Reporting Directive and Taxonomy Framework	LO1: To learn the goals, key principles and application rules of the Corporate Sustainability Reporting Directive and the Taxonomy Regulation Framework.	<ol style="list-style-type: none"> 1. CSRD regulation 2. Description of the Taxonomy Regulation 3. Case studies 	1.75	0.75	2.50
		2.2	Ecodesign for Sustainable Products Regulation (ESPR)	LO2: To learn the key principles and application rules of the European Ecodesign regulation.	<ol style="list-style-type: none"> 1. Description of the ESPR regulation 2. Recommendation for furniture companies 3. GPP and Ecolabel criteria 4. Case studies 	3.75	0.75	4.50
		2.3	From the Waste Regulation to the right to repair	LO3: To learn the regulation about Extended Producers Responsibility, waste and the consumers' right to repair.	<ol style="list-style-type: none"> 1. Waste Framework Directive 2. Packaging and Packaging Waste Directive 3. Right to repair 	2.00	0.50	2.50
		2.4	EU Deforestation Regulation	LO4: To learn the key principles and application rules of the EUDR regulation economy	<ol style="list-style-type: none"> 1. Description of the EUDR regulation 2. Compliance solution for companies along the timber-furniture value chain 	2.00	0.50	2.50
		2.5	Chemicals of Furniture Products	LO5: To learn the main legislative regulations for chemicals in the furniture sector.	<ol style="list-style-type: none"> 1. REACH and relevant general chemical regulations 2. Formaldehyde restrictions and alternatives 3. Melamine status 4. VOC regulations 5. Wood Treatments and Preservatives 6. Flame Retardants 7. Green Chemistry 8 Case studies 	2.00	0.50	2.50

D4.1 Definition of CETM Joint Curricula Report

CETM final curricula *Voluntary Instruments* module information and training commitment

MOD #	MODULE NAME	PILL #	PILL TITLE	LEARNING OUTCOME	PILL TOPICS	COURSE DURATION (HOURS)	PROJECT DURATION (HOURS)	TOTAL DURATION (HOURS)
3	Voluntary Instruments	3.1	Environmental attributes in furniture companies and certifications and voluntary environmental instruments to communicate them	LO1: Know and understand the main environmental attributes of furniture companies and their products and learn how to take voluntary actions to improve their environmental performance.	<ol style="list-style-type: none"> 1. Main environmental attributes in furniture companies: organization, manufacturing, product and distribution. 2. Guidelines for progress towards environmental improvement and obtaining certifications 3. What and how to communicate your environmental improvement and certifications? 	3.25	0.75	4.00
		3.2	Certifications and voluntary environmental instruments applicable at company level	LO2: Know what certification options and voluntary environmental instruments exist for furniture companies and be able to identify the most appropriate ones for my company.	<ol style="list-style-type: none"> 1. ISO 14001 / EMAS - Environmental Management System 2. ISO 14006 - Ecodesign 3. ISO 59000 – Circular Economy (mention the standard, but not explain) 4. ISO 50001 - Energy Management System 5. ISO 14064 / GHG Protocol - Organization Carbon Footprint 6. B Corp ISO / ISO 26000 - Corporate Social Responsibility 	3.50	0.50	4.00
		3.3	Certifications and voluntary environmental instruments applicable at product level	LO3: Know what certification options and voluntary environmental instruments exist for furniture products and be able to identify the most appropriate ones for my products.	<ol style="list-style-type: none"> 1. ISO 14024 - Ecolabel Type I (EU Ecolabel, Mobelfakta, Blauer Engel, Nordic Swan, NF Environnement, Cradle to Cradle) 2. ISO 14021 - Ecolabels Type II (Environmental self-declarations) 3. ISO 14025 - Ecolabels Type III (Environnemental Product Declarations) 4. OEKO-TEX® - Hazardous substances 5. Greenguard - Chemical emissions 6. ISO 14067 / PAS 20250 / GHG Protocol - Product Carbon Footprint 7. FSC / PEFC / ISO 38200 – Chain of Custody 8. ISO 14040/44 - Life Cycle Assessment (mention the standard, but not explain) 	4.00	0.50	4.50
		3.4	Alignment with my clients' certifications and voluntary environmental instruments	LO4: To understand how I can align my voluntary environmental improvement strategy with the needs and expectations of my clients.	<ol style="list-style-type: none"> 1. Green Product Procurement (GPP) 2. LEED, BREEAM, WEELL- Sustainable Construction 3. ISO 21401 / Travel Life / Biosphere - Sustainable Tourism 	2.50	0.50	3.00

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CETM final curricula *Circular Business Models* module information and training commitment

MOD #	MODULE NAME	PILL #	PILL TITLE	LEARNING OUTCOME	PILL TOPICS	COURSE DURATION (HOURS)	PROJECT DURATION (HOURS)	TOTAL DURATION (HOURS)
4	Circular Business Models	4.1	Business model innovation for sustainability	LO1: To understand the importance of business model innovation as a driver for sustainability.	1. the importance of Business models 2. Business models as a tool for sustainable transition 3. sustainable business models archetypes and examples	2.00	0.50	3.00
		4.2	Circular business models archetypes	LO2: To identify and describe the different circular business model archetypes and their application in the industry.	1. Circular value hill 2. RESOLVE framework 3. Circular business models examples in furniture	2.00	0.50	2.50
		4.3	Circular business model innovation tools and processes	LO3: To apply circular business model design tools to lead an effective transition.	1. Business model innovation design for circularity 2. Circular business models tools	1.75	0.75	2.50
		4.4	Thinking in systems	LO4: To understand the role of systems thinking in developing circular value networks.	1. Circular ecosystems definitions 2. orchestrating a value network	2.00	0.50	2.50
		4.5	Communicating circular value to customers	LO5: To communicate the value of circular products to consumers effectively. LO6: To learn the regulation criteria about the communication of sustainability to end users to avoid greenwashing.	1. Engaging consumers in circular practices through education and marketing strategies. 2. Communication strategies and guidelines 3. Green Claims Directive 4. Case studies	2.00	0.50	2.50

CETM final curricula *Circular Design* module information and training commitment

MOD #	MODULE NAME	PILL #	PILL TITLE	LEARNING OUTCOME	PILL TOPICS	COURSE DURATION (HOURS)	PROJECT DURATION (HOURS)	TOTAL DURATION (HOURS)
5	Circular Design	5.1	Introduction to Circular Design for Furniture	LO1: Learners will be provided with basic information about the discipline of Circular Design for the furniture sector and the role of design and designers for the field.	1. General concepts on the introduction of the chapter contents (Circular Design) 2. The role of design and designers	2.00	0.50	2.50
		5.2	From Green to Circular Design: The Evolution of Design for Sustainability in the Furniture Sector	LO2: Learners will be informed about historical steps into Circular Design discipline for furniture sector, looking at real case studies, in order to comprehend the evolution of the discipline..	1.The evolution of Circular Design over time (mainly through case studies and events/actions/milestones of importance) 2. In between Circular Design evolution and the Furniture Sector	2.00	0.50	2.50
		5.3	Life Cycle Thinking	LO3: Learners will be able to manage the Furniture Product Life Cycle concept and its impact on the environment; to discuss the methodologies for evaluating the impact of these; to discuss the design approach (LCD).	1. Life Cycle 2. Life Cycle Assessment / Product Environmental Footprint (Convene with Manufacturing Processes) 3. EPD Environmental Product Declarations (case studies from EPD to LCA) 4. Life Cycle Design (introduction to the circular mindset and strategies then developed in the next two chapters; methodologies for prioritizing different strategies in the project)	4.00	0.50	4.50
		5.4	Strategies of Design for Circular Furniture	LO4: Learners will be able to manage and will know the strategies to use inside the design process of a low-impact furniture product.	1.Smarter product use and manufacture (Refuse, Rethink, Reduce) 2. Extend lifespan of product and its part (Re-use, Repair, Refurbish, Remanufacture, Repurpose)	3.75	0.75	4.50
		5.5	Design mindset for low-impact manufacturing and material choices	LO5: Learners will deepen the designer point of view on the choice for manufacturing and material choices inside the design process.	1. Materials and technologies selection into the design process 2. Impact of the selection into Circular Design	.00	0.75	3.75
		5.6	Methodology for the Circular Designer	LO6: Learners will be able to manage practically the previously cited theoretical methodologies into a furniture project.	Here the description of the practical steps the new managing figure must follow to utilize the tools and the theoretical concepts previously described in the course.	3.00	0.75	3.75

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CETM final curricula *New & Sustainable Materials* module information and training commitment

MOD #	MODULE NAME	PILL #	PILL TITLE	LEARNING OUTCOME	PILL TOPICS	COURSE DURATION (HOURS)	PROJECT DURATION (HOURS)	TOTAL DURATION (HOURS)
6	New & Sustainable Materials	6.1	Sustainable materials for wood bonding and coating	LO1: To identify and analyse sustainable adhesives and coatings in furniture industry and the environmental aspects of their use.	<ol style="list-style-type: none"> 1. Water-based adhesive materials: application aspects 2. Solvent-free adhesives 3. Water-based coating materials 4. Powder coating materials 5. Oils and waxes for coating 	3.50	0.50	4.00
		6.2	Sustainable materials for upholstered furniture	LO2: To identify and analyse sustainable materials used for upholstered furniture.	<ol style="list-style-type: none"> 1. Textiles: purpose, properties, and environmental impact 2. Types of eco-friendly fabrics for furniture: palm fibre, hemp, linen, etc. 3. Innovative textile materials with integrated functions 	2.00	0.50	2.50
		6.3	Innovative materials for furniture manufacturing	LO3: To identify alternative construction materials, advantages and disadvantages of their application.	<ol style="list-style-type: none"> 1. Biopolymers and bio-composites 2. Thermally modified wood 3. Bamboo 4. Plastic waste 5. Mycelium based composites 6. Materials with integrated functions: self-healing, antimicrobial, etc. 	2.00	0.50	2.50
		6.4	Used Furniture as a Raw Material for Furniture Manufacturing	LO4: To analyse the condition of used furniture and determine the optimal ways for its subsequent use.	<ol style="list-style-type: none"> 1. Used furniture as a raw material: advantages and challenges 2. Assessment of the condition of used furniture 	2.00	0.50	2.50
		6.5	Sustainable development in furniture industry	LO5: To understand and apply sustainable development in furniture manufacturing.	<ol style="list-style-type: none"> 1. Sustainable development: concept evolution and current acceptance 2. Sustainable development in furniture industry 3. Outcomes of the sustainability in furniture industry 	3.50	0.50	4.00

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		6.6	Materials used in the furniture industry	LO6: To identify and describe the materials used in furniture industry in the context of the circular economy.	<ol style="list-style-type: none"> 1. Solid wood as raw material for furniture industry 2. Wood based materials and their applications 3. Materials with impact on the environment 4. Waste materials in furniture industry 	4.00	0.50	4.50
		6.7	Waste materials circularity in furniture industry	LO7: To select and analyse the potential use of the waste materials for circularity.	<ol style="list-style-type: none"> 1. Recycled materials 2. Recyclable materials 3. Reuse of materials 4. Examples 	3.50	0.50	4.00
		6.8	Sustainable materials for furniture industry	LO8: To integrate the sustainability concept as a driver for circularity.	<ol style="list-style-type: none"> 1. Alternative materials for wood 2. Wood biomass as sustainable materials 3. Agricultural waste resources as alternative materials for wood 4. Use of additive manufacturing in furniture industry 5. Examples 	4.00	0.50	4.50
		6.9	R&D techniques for new products	LO9: To apply R&D methods in order to integrate waste materials into new products.	<ol style="list-style-type: none"> 1. State of art 2. Design and develop new products 3. Testing, analysis and compare 4. New products validation 5. Technological transfer of the new products 6. Examples 	3.50	0.50	4.00

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CETM final curricula *Key Enabling Technologies* module information and training commitment

MOD #	MODULE NAME	PILL #	PILL TITLE	LEARNING OUTCOME	PILL TOPICS	COURSE DURATION (HOURS)	PROJECT DURATION (HOURS)	TOTAL DURATION (HOURS)
7	Key Enabling Technologies	7.1	Foundations of Enabling Technologies for Circular Economy	LO1: To understand the basic principles of enabling technologies. LO2: Recognise key concepts driving digital and green transformations in the context of the circular economy.	1. Overview of Key Enabling Technologies. 2. Core Concepts of Digital and Green Transformations. 3. Essential Technologies Supporting Sustainable Innovation. 4. Impact of Enabling Technologies on Circularity	3.00	1.00	4.00
		7.2	Technologies Supporting the Circular Economy in the furniture sector.	LO3: To identify and define enabling technologies applicable to the circular economy in the furniture sector. LO4: To understand the challenges and opportunities in implementing enabling technologies for circular economy in the furniture sector.	1. Key technologies for circular economy (e.g., IoT, AI, robotic, 3D Printing) 2. Applications of technologies in circular processes 3. Common challenges and opportunities in adopting enabling technologies for circular economy. 4. Case studies of successful technology implementation in circular businesses (furniture industry)	3.50	0.50	4.00
		7.3	Digitalisation as a Catalyst for Circular Economy	LO5: To explain the role of digitalization in advancing the circular economy, reducing waste, and optimising resource use.	1. Digital Tools and Their Applications in Circular Processes. 2. Digitalization as a Driver for Waste Reduction and Resource Optimization. 3. Digital twins and their role in product lifecycle management.	3.50	0.50	4.00
		7.4	Selecting Technologies for Digital and Green Transitions in Manufacturing	LO6: To identify suitable enabling technologies for specific manufacturing processes. LO7: Explain the KETs benefits in supporting a circular transition through digital and environmental transformation.	1. Understanding Digital and Green Transitions in Manufacturing. 2. Lifecycle Applications of Enabling Technologies. 3. Applications of advanced manufacturing technologies in the furniture industry.	3.50	0.50	4.00

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CETM final curricula *Manufacturing Processes* module information and training commitment

MOD #	MODULE NAME	PILL #	PILL TITLE	LEARNING OUTCOME	PILL TOPICS	COURSE DURATION (HOURS)	PROJECT DURATION (HOURS)	TOTAL DURATION (HOURS)
8	Manufacturing Processes	8.1	Energy Consumption	LO1: To consider consumption of energy issues and management strategies when manufacturing furniture for the circular economy.	<ol style="list-style-type: none"> 1. Carbon Reduction Strategies 2. Maintenance Management 3. Machine Efficiency 4. Carbon Calculations and LCA 	1.75	0.75	2.50
		8.2	Production planning	LO2: To adopt production planning techniques to achieve circularity in a furniture manufacturing workshop.	<ol style="list-style-type: none"> 1. Processing technology. Processing waste and factors influencing their quantity 2. Cutting/ optimisation of the sawn and board materials 3. Optimization of the primary mechanical processing 4. Secondary mechanical processing technology. Waste, their types and reduction methods. 5. Assembly defects (waste) and their optimization. Gluing processes. Causes of gluing defects. 	3.25	0.75	4.00
		8.3	Waste material Management	LO3:To learn how to manage manufacturing waste and byproducts to ensure circularity.	<ol style="list-style-type: none"> 1.The waste management hierarchy 2. How to assess resource-efficiency of current furniture company 3. Action plan to save money through waste reduction 4. Processes for restoring used furniture to their original appearance and functionality 5. Recycling furniture to obtain products of other sizes or separate parts for other purposes 6. Recycling furniture unfit for further use to obtain raw materials for board 	3.00	0.50	3.50
		8.4	Re-manufacturing and Reverse Logistics	LO4:To understand and apply remanufacturing and reverse logistics within the context of circular furniture manufacturing.	<ol style="list-style-type: none"> 1. Assessment & selection of the appropriate R strategy 2. Onsite Recovery Process (byproducts, secondary material etc.) 3. Reverse Logistics- Creating co-operative Relationships 4. Furniture Reutilisation Management (tracking, storage, EPR) 5. Design for Assembly and Design for Disassembly 	2.50	0.50	3.00
		8.5	Lean-Green Approach and Operations management	LO5: To develop an understanding of how the Lean Manufacturing concept can support CE transitioning.	<ol style="list-style-type: none"> 1. Interrelatedness of Lean and the CE 2. Key lean principles to support CE transitioning 3. Workshop Waste Accumulation (tacking, designated area, reduction strategies) 4. Byproducts (storage, tracking, selection process for new process) 5. Creating an agile workflow for reutilised material 	2.50	0.50	3.00

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CETM final curricula *Circular Economy Transition Strategy* module information and training commitment

MOD #	MODULE NAME	PILL #	PILL TITLE	LEARNING OUTCOME	PILL TOPICS	COURSE DURATION (HOURS)	PROJECT DURATION (HOURS)	TOTAL DURATION (HOURS)
9	Circular Economy Transition Strategy	9.1	Circular economy: opportunity for manufacturing companies	LO1: Understand the key differences between the Circular Economy and the Linear Economy. LO2: Identify the primary benefits and challenges of adopting a Circular Economy approach.	1. Introduction to Circular Economy vs Linear Economy 2. Circular economy framework and principles 3. Circular economy benefits and challenges	1.75	0.75	2.50
		9.2	Circular Economy Strategy	LO3: Outline the necessary steps to develop a Circular Economy strategy.	1. Steps of a Circular Economy Strategy	2.00	0.50	2.50
		9.3	Step 1. Assessment and goal setting	LO4: Analyze the current business model to detect inefficiencies and opportunities for circularity. LO5: Set clear circular objectives based on sustainability goals.	1. Analyse Current Business Model 2. Establish circular economy goals 3. Circular Economy Action Plan development 4. Technology watch to set potential improvements	3.00	0.50	3.50
		9.4	Step 2. Redesign products and processes for circularity	LO6: Engage key stakeholders to ensure the successful transition to a circular economy. LO7: Know and identify the key drivers and tools to implement circular economy practices.	1. Engage all key actors and build capacity 2. Drivers and tools for circular economy implementation	3.50	0.50	4.00
		9.5	Step 3. Monitoring and assessing circularity	LO8: Use circular indicators to evaluate and monitor circularity within the company.	1. Circular indicators 2. Tools to measure circularity	2.00	0.50	2.50
		9.6	Standards for circularity	LO9: Understand and apply the ISO 59000 standards related to circular economy practices. LO10: Identify other relevant standards for implementing circular economy practices within the furniture industry.	1. ISO 59000 standards (explain how to apply this to a business) 2. Other ISO standards related with Circular Economy within the furniture industry	2.00	0.50	2.50

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CETM final curricula *Closing* module information and training commitment

MOD #	MODULE NAME	PILL #	PILL TITLE	LEARNING OUTCOME	PILL TOPICS	COURSE DURATION (HOURS)	PROJECT DURATION (HOURS)	TOTAL DURATION (HOURS)
10	Closing	10.1	Wrapping up and future directions	LO1: reflect on the learning journey and look ahead into future sustainability developments.	1. Key take aways of the circular transition journey 2. Limits and future directions	2.00	0.00	2.00

Annex 3

CETM final curricula *Circular Economy Introduction* module competencies framework mapping

MOD #	MODULE NAME	PILL #	PILL TITLE	COMPETENCY AREAS	COMPETENCIES
1	Circular Economy Introduction	1.1	The urgency of change: rethinking industry and sustainability	1. Values Thinking	1.1 Sustainability awareness 1.2 Embodying values 1.3 Circular mindset
		1.2	Sustainable development & global frameworks: rethinking Industry for a resilient future	1. Values Thinking	1.1 Sustainability awareness 1.2 Embodying values 1.3 Circular mindset
		1.3	Circular Economy: rethinking waste, resources, and industry	1. Values Thinking	1.1 Sustainability awareness 1.2 Embodying values 1.3 Circular mindset
		1.4	The Circular Economy: a win for the planet, business, and society	1. Values Thinking	1.1 Sustainability awareness 1.2 Embodying values 1.3 Circular mindset
		1.5	The role of the Circular Economy Transition Manager: leading the change in the furniture industry	1. Values Thinking	1.1 Sustainability awareness 1.2 Embodying values 1.3 Circular mindset

CETM final curricula *Legislative Instruments* module competencies framework mapping

MOD #	MODULE NAME	PILL #	PILL TITLE	COMPETENCY AREAS	COMPETENCIES
2	Voluntary Instruments	2.1	Corporate Sustainability Reporting Directive and Taxonomy Framework	3. System Thinking	3.3 Governance and Policies
		2.2	Ecodesign for Sustainable Products Regulation (ESPR)	3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking	3.3 Governance and Policies 4.3 Circular Impact Assessment 5.2 Circular Design Innovation
		2.3	From the Waste Regulation to the right to repair	3. Systems Thinking	3.3 Governance and Policies
		2.4	EU Deforestation Regulation	3. Systems Thinking	3.3 Governance and Policies
		2.5	Chemicals of Furniture Products	3. Systems Thinking	3.3 Governance and Policies

CETM final curricula *Voluntary Instruments* module competencies framework mapping

MOD #	MODULE NAME	PILL #	PILL TITLE	COMPETENCY AREAS	COMPETENCIES
3	Voluntary Instruments	3.1	Environmental attributes in furniture companies and certifications and voluntary environmental instruments to communicate them	1. Values Thinking 2. Interpersonal Thinking 3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking	1.3 Circular Mindset 2.2 Communication & Navigation 3.1 Navigating Complexity 3.2 Critical Thinking 4.1 Agenda Setting 5.2 Circular Design Innovation
		3.2	Certifications and voluntary environmental instruments applicable at company level	1. Values Thinking 2. Interpersonal Thinking 3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking	1.3 Circular Mindset 2.2 Communication & Navigation 3.2 Critical Thinking 4.3 Circular Impact Assessment 5.3 Circular Business Model Innovation
		3.3	Certifications and voluntary environmental instruments applicable at product level	1. Values Thinking 2. Interpersonal Thinking 3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking	1.3 Circular Mindset 2.2 Communication & Navigation 3.2 Critical Thinking 4.3 Circular Impact Assessment 5.2 Circular Design Innovation
		3.4	Alignment with my clients' certifications and voluntary environmental instruments	1. Values Thinking 2. Interpersonal Thinking 3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking	1.3 Circular Mindset 2.2 Communication & Navigation 3.2 Critical Thinking 5.4 Circular Value Network Innovation

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CETM final curricula *Circular Business Models* module competencies framework mapping

MOD #	MODULE NAME	PILL #	PILL TITLE	COMPETENCY AREAS	COMPETENCIES
4	Circular Business Models	4.1	Business model innovation for sustainability	1. Values thinking 5. Operational thinking	1.1 Sustainability awareness 5.3 Circular business model innovation
		4.2	Circular business models archetypes	1. Value thinking 5. Operational thinking	1.3 Circular mindset 5.3 Circular business model innovation
		4.3	Circular business model innovation tools and processes	5. Operational thinking 6. Future thinking	5.3 Circular business model innovation 6.2 Exploratory thinking
		4.4	Thinking in systems	3. Systems thinking 5. Operational thinking 2. Interpersonal thinking	3.2 Critical thinking 5.4 Circular value network innovation 2.1 Collaboration and collective action
		4.5	Communicating circular value to customers	2. Interpersonal thinking	2.2 Communication and navigation

CETM final curricula *Circular Design* module competencies framework mapping

MOD #	MODULE NAME	PILL #	PILL TITLE	COMPETENCY AREAS	COMPETENCIES
5	Circular Design	5.1	Introduction to Circular Design for Furniture	1. Values thinking 3. Systems thinking	1.1 Sustainability awareness 1.2 Embodying values 1.3 Circular mindset 3.3 Governance and policy
		5.2	From Green to Circular Design: The Evolution of Design for Sustainability in the Furniture Sector	2. Interpersonal thinking 4. Strategic thinking 5. Operational thinking 6. Future thinking	2.1 Collaboration and Collective action 4.1 Agenda setting 5.2 Circular design innovation 6.1 Future literacy
		5.3	Life Cycle Thinking	3. Systems thinking 4. Strategic thinking	3.1 Navigating complexity 4.3 Circular impact assessment
		5.4	Strategies of Design for Circular Furniture	5. Operational thinking	5.2 Circular design innovation
		5.5	Design mindset for low-impact manufacturing and material choices	5. Operational thinking	5.1 Circular material innovation 5.2 Circular design innovation
		5.6	Methodology for the Circular Designer	5. Operational thinking	5.2 Circular design innovation

CETM final curricula *New & Sustainable Materials* module competencies framework mapping

MOD #	MODULE NAME	PILL #	PILL TITLE	COMPETENCY AREAS	COMPETENCIES
6	New & Sustainable Materials	6.1	Sustainable materials for wood bonding and coating	3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking	3.2 Critical thinking 4.2. Resource mobilisation 5.1.Circular Material innovation. 5.4 Circular Value Network innovation.
		6.2	Sustainable materials for upholstered furniture	3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking	3.2 Critical thinking 4.2. Resource mobilisation 5.1.Circular Material innovation. 5.4 Circular Value Network innovation.
		6.3	Innovative materials for furniture manufacturing	3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking	3.2 Critical thinking 4.2. Resource mobilisation 5.1.Circular Material innovation. 5.4 Circular Value Network innovation.
		6.4	Used Furniture as a Raw Material for Furniture Manufacturing	3. Systems Thinking 4. Strategic Thinking 5. Operational Thinking	3.2 Critical thinking 4.2. Resource mobilisation 5.1.Circular Material innovation. 5.4 Circular Value Network innovation.
		6.5	Sustainable development in furniture industry	5. Operational thinking	5.3 Circular business model innovation
		6.6	Materials used in the furniture industry	4. Strategic thinking	4.3 Impact assessment
		6.7	Waste materials circularity in furniture industry	4. Strategic thinking	4.2 Resource mobilisation
		6.8	Sustainable materials for furniture industry	5. Operational thinking	5.1 Circular material innovation
		6.9	R&D techniques for new products	5. Operational thinking 6. Future thinking	5.1 Circular material innovation 6.1 Futures literacy 6.2 Exploratory thinking

CETM final curricula *Key Enabling Technologies* module competencies framework mapping

MOD #	MODULE NAME	PILL #	PILL TITLE	COMPETENCY AREAS	COMPETENCIES
7	Key Enabling Technologies	7.1	Foundations of Enabling Technologies for Circular Economy	5. Operational thinking 6. Future thinking	5.5 Key Enabling Technologies 6.3 Key Enabling Technologies
		7.2	Technologies Supporting the Circular Economy in the furniture sector.	5. Operational thinking 6. Future thinking	5.5 Key Enabling Technologies 6.3 Key Enabling Technologies
		7.3	Digitalisation as a Catalyst for Circular Economy	5. Operational thinking 6. Future thinking	5.5 Key Enabling Technologies 6.3 Key Enabling Technologies
		7.4	Selecting Technologies for Digital and Green Transitions in Manufacturing	5. Operational thinking 6. Future thinking	5.5 Key Enabling Technologies 6.3 Key Enabling Technologies

CETM final curricula *Manufacturing Processes* module competencies framework mapping

MOD #	MODULE NAME	PILL #	PILL TITLE	COMPETENCY AREAS	COMPETENCIES
8	Manufacturing Processes	8.1	Energy Consumption	3. Systems Thinking 4. Strategic Thinking	3.1 Navigating Complexity 4.2 Resource Mobilisation 4.3 Circular Impact Assessment
		8.2	Production planning	4. Strategic Thinking	4.1 Agenda Setting 4.2 Resource Mobilisation
		8.3	Waste material Management	4. Strategic Thinking 5. Operational Thinking	4.2 Resource Mobilisation 5.3 Circular Business Model Innovation
		8.4	Re-manufacturing and Reverse Logistics	4. Strategic Thinking 5. Operational Thinking	4.2 Resource Mobilisation 5.1 Circular material innovation
		8.5	Lean-Green Approach and Operations management	4. Strategic Thinking 5. Operational Thinking 6. Future Thinking	4.2 Resource mobilisation 5.4 Circular Value Network Innovation 6.2 Exploratory Thinking

CETM final curricula *Circular Economy Transition Strategy* module competencies framework mapping

MOD #	MODULE NAME	PILL #	PILL TITLE	COMPETENCY AREAS	COMPETENCIES
9	Circular Economy Transition Strategy	9.1	Circular economy: opportunity for manufacturing companies	1. Value thinking 3. Systems thinking	1.1 Sustainability awareness 1.2 Embodying values 1.3 Circular mindset 3.3 Governance & policies
		9.2	Circular Economy Strategy	4. Strategic Thinking 5. Operational Thinking	4.1 Agenda setting 5.4 Circular value network innovation
		9.3	Step 1. Assessment and goal setting	3. Systems Thinking 6. Future Thinking	3.1 Navigating complexity 3.2 Critical thinking 6.1 Future literacy
		9.4	Step 2. Redesign products and processes for circularity	4. Strategic Thinking	4.2 Resource mobilisation
		9.5	Step 3. Monitoring and assessing circularity	3. Systems Thinking 4. Strategic Thinking	3.2 Critical thinking 3.3 Governance & policies 4.3 Circular impact assessment
		9.6	Standards for circularity	3. Systems Thinking	3.3 Governance & policies

CETM final curricula *Closing* module competencies framework mapping

MOD #	MODULE NAME	PILL #	PILL TITLE	COMPETENCY AREAS	COMPETENCIES
10	Closing	10.1	Wrapping up and future directions	4. strategic thinking 6. future thinking	4.1 Agenda Setting 4.2 Resource Mobilisation 6.1 Future Literacy

Annex 4

CETM micro credentials mapped to the *Circular Economy Introduction* module

MOD #	MODULE NAME	PILL #	PILL TITLE	MICRO CREDENTIAL TITLE	MICRO CREDENTIAL DESCRIPTION
1	Circular Economy Introduction	1.1	The urgency of change: rethinking industry and sustainability	Rethinking industry and sustainability	This micro credential provides a basic introduction to the latest environmental challenges and sustainability practices in the furniture industry. Learners will gain a general awareness of global environmental issues, including climate change, biodiversity loss, and resource depletion, as well as a broad understanding of the industry's role in environmental impact. The certification offers an initial overview of sustainability concepts, ethical values, and circular economy principles, giving professionals a starting point to explore sustainable transformation.
		1.2	Sustainable development & global frameworks: rethinking Industry for a resilient future	Global approaches to sustainability	This micro credential provides an introductory overview of global strategies for addressing environmental and climate challenges, with a focus on sustainable development frameworks. Learners will be introduced to key sustainability models, such as the Sustainable Development Goals (SDGs), planetary boundaries, and doughnut economics, gaining a basic understanding of their relevance to policies and business strategies. This certification offers a foundational perspective for those interested in aligning their practices with international sustainability objectives.
		1.3	Circular Economy: rethinking waste, resources, and industry	Introduction to Circular Economy	This micro credential provides a fundamental introduction to circular economy principles as an alternative to the traditional linear economy. Learners will explore the basic concepts of circularity, including circular products, regenerative strategies, and the Butterfly Model, gaining an initial understanding of their role in sustainability. This certification serves as a starting point for those looking to familiarize themselves with circular economy strategies.
		1.4	The Circular Economy: a win for the planet, business, and society	Benefits of Circular Economy	This micro credential offers an introductory look at the main advantages of circular economy practices, including their environmental, economic, and social benefits. Learners will explore how circular strategies can improve resource efficiency, reduce costs, encourage innovation, and create social value at a basic level. This certification provides a general understanding of how circular economy principles can support sustainable growth and resilience.
		1.5	The role of the Circular Economy Transition Manager: leading the change in the furniture industry	The role of a Circular Economy Transition Manager (CETM)	This micro credential introduces the role of a Circular Economy Transition Manager, offering a broad overview of how this professional supports sustainable change. Participants will learn about the general responsibilities involved in facilitating circular strategies, engaging stakeholders, and overseeing basic aspects of circular economy implementation. The complete course covers essential competencies needed to guide businesses through the transition, fostering innovation, sustainability, and long-term resilience in a circular economy framework.

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CETM micro credentials mapped to the *Legislative Instruments* module

MOD #	MODULE NAME	PILL #	PILL TITLE	MICRO CREDENTIAL TITLE	MICRO CREDENTIAL DESCRIPTION
2	Legislative Instruments	2.1	Corporate Sustainability Reporting Directive and Taxonomy Framework	Understanding CSRD and the Taxonomy Framework	This micro credential certifies knowledge of the goals, key principles, and application rules of the Corporate Sustainability Reporting Directive (CSRD) and the Taxonomy Regulation Framework. Learners will explore the regulatory requirements, governance principles, and the role of sustainability reporting in corporate strategy. The course includes case studies to illustrate real-world applications and challenges in compliance. This certification equips professionals with essential knowledge to navigate sustainability regulations and enhance corporate transparency in alignment with EU directives.
		2.2	Ecodesign for Sustainable Products Regulation (ESPR)	Understanding the Ecodesign for Sustainable Products Regulation	This micro credential validates expertise in the European Ecodesign for Sustainable Products Regulation, focusing on its core principles, implementation guidelines, and industry implications. Participants will examine regulatory frameworks, strategic compliance approaches, and sustainability criteria supported by real-world case studies. This certification empowers professionals with the skills to interpret policy frameworks, measure circular impact, and advance eco-innovative design practices within the furniture sector.
		2.3	From the Waste Regulation to the right to repair	Knowledge on the Extended Producer Responsibility	This micro credential certifies knowledge of key regulations on extended producer responsibility, waste management, and consumer rights to repair. Learners will explore the Waste Framework Directive, the Packaging and Packaging Waste Directive, and the evolving legal framework supporting circularity and sustainability. This certification equips professionals with the expertise to navigate regulatory requirements, promote sustainable waste management practices, and support a circular economy.
		2.4	EU Deforestation Regulation	Understanding the EU Deforestation Regulation (EUDR)	This micro credential certifies knowledge of the key principles and application rules of the EU Deforestation Regulation (EUDR). Learners will explore the regulatory framework, its impact on the timber and furniture value chain, and compliance solutions for companies. The course equips professionals with the expertise to navigate the EUDR requirements, ensuring that businesses understand their responsibilities and implement practices that support sustainable sourcing and deforestation-free supply chains.
		2.5	Chemicals of Furniture Products	Expertise in Chemical Regulations for the Furniture Sector	This micro credential validates expertise in key chemical regulations within the furniture sector, covering the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH), formaldehyde limitations, VOC guidelines, and alternatives to hazardous substances. Learners will delve into legal frameworks for melamine, wood treatments, flame retardants, and green chemistry, supported by case studies showcasing real-world applications. This certification equips professionals with the knowledge to navigate regulatory requirements, ensure compliance, and adopt safer, more sustainable practices in the furniture industry.

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CETM micro credentials mapped to the *Voluntary Instruments* module

MOD #	MODULE NAME	PILL #	PILL TITLE	MICRO CREDENTIAL TITLE	MICRO CREDENTIAL DESCRIPTION
3	Voluntary Instruments	3.1	Environmental attributes in furniture companies and certifications and voluntary environmental instruments to communicate them	Identifying, improving, and communicating key environmental attributes in furniture companies.	This micro credential ensures that learners understand how to identify, communicate, and improve key environmental attributes in furniture companies and their value chain. Learners understand how to categorize attributes into four approaches: organizational, manufacturing, product, and distribution. Learners know progress guidelines to assess current performance, set improvement goals, and communicate sustainability efforts. Learners can tailor their environmental strategy based on their market, products, and objectives to enhance sustainability and competitiveness.
		3.2	Certifications and voluntary environmental instruments applicable at company level	Identifying and understanding main voluntary environmental certifications that could be implemented in furniture companies.	This micro credential ensures that learners know the main voluntary environmental certifications at company level, the relevant aspects they cover and the benefits linked to their implementation. These voluntary schemes cover aspects such as environmental management; eco-design management; circular economy management; energy efficiency and management; greenhouse gas accounting; and social responsibility. Learners will be able to identify if these schemes could be implemented in their organisations and what potential competitive advantages they could bring, in line with their sustainability strategy.
		3.3	Certifications and voluntary environmental instruments applicable at product level	Identifying and understanding main voluntary environmental certifications that could be implemented for furniture products and services.	This micro credential ensures that learners know the main voluntary environmental certifications at product level, the relevant aspects covered by them and the benefits associated with their implementation. These voluntary instruments cover aspects such as ecolabels, hazardous substances content in textiles, low chemical emissions, product carbon footprint and chain of custody. Learners can identify if these schemes could be implemented in their products and the potential competitive advantages that they could bring, aligned with their sustainability strategy.
		3.4	Alignment with my clients' certifications and voluntary environmental instruments	Identifying and understanding how to be aligned with clients' requirements related to sustainable criteria in construction and tourism sectors and GPP criteria for furniture products.	This micro credential ensures that learners know the selection criteria that their clients could apply if their strategy are based on Green Public Procurement criteria or voluntary sustainability certification systems in construction and tourism sectors. These criteria covers aspects such as durability, reparability, use of hazardous substances, raw materials certifications, EPDs, etc. Learners can identify how to align its own company strategy to these criteria, and the potential competitive advantages associated to it.

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CETM micro credentials mapped to the *Circular Business Models* module

MOD #	MODULE NAME	PILL #	PILL TITLE	MICRO CREDENTIAL TITLE	MICRO CREDENTIAL DESCRIPTION
4	Circular Business Models	4.1	Business model innovation for sustainability	Business model as a driver for sustainability	This micro credential certifies knowledge in business model innovation as a catalyst for both business sustainability and ecological transformation. Learners will explore how business models function as strategic tools for sustainable transitions, gaining insights into key archetypes and real-world examples. This certification supports continuous learning and adaptation, enabling professionals to drive long-term sustainable and ecological impact through business innovation.
		4.2	Circular business models archetypes	Understanding circular business models	This micro credential certifies knowledge in circular business model archetypes. Learners acquire relevant knowledge on the emerging concept of circular business models. Learners can position circular business models within the larger sustainable business model concept, classify and understand key relevant circular business model strategies and approaches.
		4.3	Circular business model innovation tools and processes	Circular business model innovation design	This micro credential certifies knowledge on designing circular business models. Learners understand the process of designing circular business models and have an overview of tools and approaches useful to lead the transformation. Learners are able to design new value propositions based on circular economy concepts, understand the role of experimentation and recognise existing barriers hindering the development of circular business models.
		4.4	Thinking in systems	Systems thinking for circular economy	This micro credential certifies foundational knowledge on the role of systems thinking as a catalyst for circular economy transition. Learners understand the importance of taking a systems perspective when developing circular business models; they are able to conceptualise the concept of value networks and circular ecosystems and get references on how to orchestrate such ecosystem.
		4.5	Communicating circular value to customers	Communicating circular economy value	This micro credential certifies foundational knowledge on communication for circularity. Learners acquire knowledge related to consumer engagement in circular business models and the type of value dimensions to highlight. Learners are able to define and apply the right communication strategies to support the diffusion of circular products or services. They recognize the legal framework related to green claims and can avoid greenwashing practices.

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CETM micro credentials mapped to the *Circular Design* module

MOD #	MODULE NAME	PILL #	PILL TITLE	MICRO CREDENTIAL TITLE	MICRO CREDENTIAL DESCRIPTION
5	Circular Design	5.1	Introduction to Circular Design for Furniture	Foundations of Circular Design in the Furniture Industry	This micro credential certifies foundational knowledge of Circular Design principles and the critical role of design and designers in driving sustainability within the furniture industry. Learners will explore key concepts of Circular Design, while examining how design choices influence environmental impact, material use, and industry policies. With a focus on circular mindset, governance, and policy, this certification provides essential knowledge for professionals looking to integrate sustainable design strategies into the evolving landscape of the furniture sector.
		5.2	From Green to Circular Design: The Evolution of Design for Sustainability in the Furniture Sector	Evolution of Circular Design in the Furniture Sector	This micro credential provides insights into the historical development of Circular Design within the furniture industry. Learners will explore key milestones, influential case studies, and significant events that have shaped the discipline over time. By examining the intersection of Circular Design principles and the furniture sector, participants will gain a deeper understanding of its evolution and the factors driving sustainable innovation in design.
		5.3	Life Cycle Thinking	Life Cycle Thinking in Furniture Design	This micro credential equips learners with the knowledge to assess and manage the environmental impact of furniture products throughout their life cycle. Participants will explore Life Cycle Assessment (LCA) and Product Environmental Footprint (PEF) methodologies, linking them to manufacturing processes. Through case studies, they will analyse Environmental Product Declarations (EPD) and understand how Life Cycle Design (LCD) fosters a circular mindset. This certification provides a foundational approach to prioritizing sustainable strategies in product development.
		5.4	Strategies of Design for Circular Furniture	Design Strategies for Circular Furniture	This micro credential certifies expertise in integrating circular economy principles into furniture design to minimize environmental impact. Learners will explore key strategies, including optimizing product use and manufacturing (Refuse, Rethink, Reduce), extending product lifespan (Reuse, Repair, Refurbish, Remanufacture, Repurpose), and ensuring effective material applications (Recycle, Recover). Through practical insights, this certification empowers professionals to create sustainable, long-lasting, and resource-efficient furniture solutions.
		5.5	Design mindset for low-impact manufacturing and material choices	Design Mindset for Sustainable Manufacturing and Material Choices	This micro credential certifies knowledge of sustainable decision-making in the design process, focusing on material and manufacturing choices that align with circular economy principles. Learners will explore how material selection and production technologies impact environmental sustainability and product lifecycle. Through a designer's perspective, this certification provides essential insights into creating low-impact furniture by integrating circular design strategies and responsible resource use.
		5.6	Methodology for the Circular Designer	Methodology for Circular Furniture Design	This micro credential certifies knowledge of the practical application of circular design methodologies in the furniture sector. Learners will gain hands-on experience in integrating circular economy principles, utilizing tools, and applying theoretical concepts to real-world projects. This certification equips professionals with a structured approach to designing sustainable furniture, ensuring efficient material use, extended product lifespan, and alignment with circular economy strategies.

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CETM micro credentials mapped to the *New and Sustainable Materials* module

MOD #	MODULE NAME	PILL #	PILL TITLE	MICRO CREDENTIAL TITLE	MICRO CREDENTIAL DESCRIPTION
6	New & Sustainable Materials	6.1	Sustainable materials for wood bonding and coating	Sustainable Materials for Wood Bonding and Coating in the Furniture Industry	This micro credential certifies knowledge of sustainable materials used for wood bonding and coating in the furniture industry, with a focus on their environmental benefits and practical applications. Learners will explore water-based adhesives, solvent-free adhesives, water-based coatings, powder coatings, and natural oils and waxes. The course integrates systems thinking, strategic thinking, and operational skills, emphasizing critical thinking, resource mobilization, and circular material innovation. Professionals will gain the expertise needed to incorporate eco-friendly materials and promote circular value networks in the furniture sector.
		6.2	Sustainable materials for upholstered furniture	Sustainable Materials for Upholstered Furniture	This micro credential certifies knowledge of sustainable material choices for upholstered furniture, focusing on their purpose, properties, and environmental impact. Learners will explore various eco-friendly textiles such as palm fibre, hemp, and linen, alongside innovative materials with integrated functions. This certification equips professionals with the ability to identify, assess, and implement sustainable material solutions that enhance both product performance and environmental responsibility in the furniture industry.
		6.3	Innovative materials for furniture manufacturing	Knowledge of Innovative Materials in Furniture Manufacturing	This micro credential certifies expertise in alternative and emerging construction materials used in sustainable furniture manufacturing. Learners will examine the properties, benefits, and limitations of biopolymers, bio-composites, thermally modified wood, bamboo, mycelium-based composites, and materials derived from plastic waste. The course also introduces multifunctional materials with self-healing or antimicrobial capabilities. This certification empowers professionals to make informed material choices that align with circular design principles and environmental innovation.
		6.4	Used Furniture as a Raw Material for Furniture Manufacturing	Reusing Used Furniture: Strategies for Circular Material Integration	This micro credential certifies knowledge in evaluating and repurposing used furniture as raw material for new manufacturing processes. Learners will explore the benefits and challenges of working with pre-used materials and gain practical skills in assessing their condition to determine the most suitable circular strategies. This certification supports professionals in advancing sustainable practices and promoting resource efficiency within the furniture industry.
		6.5	Sustainable development in furniture industry	Sustainable development in furniture industry	This micro credential certifies knowledge about the sustainable development concept - its definition, developments and current acceptance - and sustainable design as integrative part of sustainable development concept. Learners will explore a series of good practice example of sustainable development application in furniture industry. This certification equips essentials professionals with a general view about sustainable development and sustainable design and the main outcomes of them in furniture industry.
		6.6	Materials used in the furniture industry	Materials used in the furniture industry	This micro credential certifies knowledge of the main materials used in the furniture industry. Learners will explore the types of materials, the wood species used for furniture manufacturing and the wooden based panels created to reduce the usage of solid wood resources. This certification equips professionals with the potential of approaching and selecting the appropriate raw materials for furniture manufacturing, being aware of their properties, their impact on the environment and of the waste materials resulted during the materials processing in the context of the circular economy.
		6.7	Waste materials circularity in furniture industry	Waste materials circularity in furniture industry (examples of circular material, so not to clash with Manufacturing processes)	This micro credential equips learners with the knowledge to assess and identify the waste materials resulted in the production process with potential of being recycled or reused for new materials or products. Learners will explore different types of wastes based on wood or plastics and the techniques or technologies to transform them in new products or new raw materials and to integrate them into the circular chain. This certification empowers professionals to create by recycling or reusing the waste resulted in the furniture manufacturing process of sustainable materials or products.

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		6.8	Sustainable materials for furniture industry	Sustainable materials for furniture industry	This micro credential equips learners with the knowledge of sustainable materials used for furniture manufacturing, such as wood biomass, agricultural waste resources, or structures designed and produced by additive manufacturing which can replace the wooden parts or connectors of the furniture. Learners will explore the methods of transforming the alternative resources into new raw materials. This certification empowers professionals to create new materials with alternative resources and thus integrating the sustainability concept as a driver for circularity.
		6.9	R&D techniques for new products	R&D techniques for new products	This micro credential equips learners with the knowledge of instruments and resources used as R&D techniques in order to create and develop innovative and sustainable materials for furniture industry integrating waste resources into new products. Learners will explore the phases of concept and its development starting with the laboratory phase and continuing with testing and validating the material as final product. This certification creates ability to innovate new products / materials and gives the professionals the main tools for the technological transfer of innovative materials into the industry.

CETM micro credentials mapped to the *Key Enabling Technologies* module

MOD #	MODULE NAME	PILL #	PILL TITLE	MICRO CREDENTIAL TITLE	MICRO CREDENTIAL DESCRIPTION
7	Key Enabling Technologies	7.1	Foundations of Enabling Technologies for Circular Economy	Foundations of Enabling Technologies for Circular Economy Transformation	This micro credential introduces learners to the fundamental concepts and key enabling technologies driving the transition towards a circular economy in the furniture and wood sector. Participants will explore the core principles of digital and green transformations, gaining insights into how technologies such as IoT, AI, robotics, 3D printing, big data analytics, cloud computing, and blockchain are revolutionizing industry practices. The pill covers the impact of these technologies on sustainability, resource efficiency, and innovative business models, equipping learners with the knowledge to leverage these tools for enhancing circularity and environmental responsibility in their professional contexts.
		7.2	Technologies Supporting the Circular Economy in the furniture sector.	Technologies Supporting the Circular Economy in the Furniture Sector	This micro credential examines how digitalization drives circular economy principles by reducing waste and optimizing resource use. Participants will learn about digital tools such as AI, digital twins, and cloud-based platforms, gaining insights into their role in advancing sustainability and improving lifecycle management in the furniture and wood sector.
		7.3	Digitalisation as a Catalyst for Circular Economy	Digitalisation as a Catalyst for Circular Economy	This micro credential examines how digitalization drives circular economy principles by reducing waste and optimizing resource use. Participants will learn about digital tools such as AI, digital twins, and cloud-based platforms, gaining insights into their role in advancing sustainability and improving lifecycle management in the furniture and wood sector.
		7.4	Selecting Technologies for Digital and Green Transitions in Manufacturing	Selecting Technologies for Digital and Green Transitions in Manufacturing	This micro credential focuses on identifying and selecting enabling technologies that support digital and green transitions. Learners will explore the benefits of key enabling technologies (KETs) in enhancing sustainability, improving efficiency, and fostering circular economy principles across various production processes.

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CETM micro credentials mapped to the *Manufacturing Processes* module

MOD #	MODULE NAME	PILL #	PILL TITLE	MICRO CREDENTIAL TITLE	MICRO CREDENTIAL DESCRIPTION
8	Manufacturing Processes	8.1	Energy Consumption	Sustainable Energy Practices in Circular Furniture Manufacturing	This micro credential focuses on identifying and selecting enabling technologies that support digital and green transitions. Learners will explore the benefits of key enabling technologies (KETs) in enhancing sustainability, improving efficiency, and fostering circular economy principles across various production processes.
		8.2	Production planning	Optimising Production Planning for Circular Furniture Manufacturing	This micro credential certifies knowledge of production planning techniques that enhance circularity in furniture manufacturing. Learners will explore processing technologies, waste generation factors, and methods for optimizing material use, including sawn and board materials. The course covers strategies for reducing waste in mechanical processing, improving gluing processes, and minimizing assembly defects. By mastering these techniques, professionals can enhance efficiency, reduce material waste, and support a more sustainable and circular production model.
		8.3	Waste material Management	Effective Waste and Byproduct Management for Circular Furniture Manufacturing	This micro credential certifies expertise in managing manufacturing waste and byproducts to enhance circularity in the furniture industry. Learners will explore the waste management hierarchy, assess resource efficiency, and develop cost-saving strategies through waste reduction. The course covers processes for restoring used furniture, repurposing materials into new products, and recycling components to obtain raw materials. By applying these principles, professionals can optimize waste management, reduce environmental impact, and support a sustainable, circular production system.
		8.4	Re-manufacturing and Reverse Logistics	Re-Manufacturing and Reverse Logistics in a Circular Economy	This micro credential focuses on the difference in manufacturing process between the linear and circular economy. It ensures that learners are aware of the challenges of re manufacturing and highlights ways to face them competitively in a market that remains mostly linear. Likewise, the challenges of reverse logistics are outlined and the advantages laid out.
		8.5	Lean-Green Approach and Operations management	Operations management and Lean strategies and how they can benefit the production of circular furniture.	This micro credential outlines to the learner the principles of lean manufacture and operations management and how they can benefit the manufacturing process in the circular economy. While these practices were developed for the linear economy, they have been shown to strive for the same goals- the efficient use of resources.

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CETM micro credentials mapped to the *Circular Economy Transition Strategy* module

MOD #	MODULE NAME	PILL #	PILL TITLE	MICRO CREDENTIAL TITLE	MICRO CREDENTIAL DESCRIPTION
9	Circular Economy Transition Strategy	9.1	Circular economy: opportunity for manufacturing companies	Introduction for Circular Economy Strategies for Manufacturing	This micro credential certifies knowledge in the principles and advantages of the circular economy specifically for manufacturing companies. Learners acquire relevant knowledge on the necessity of transitioning from a linear to a circular economy within the manufacturing sector. They will understand the general principles and 9R framework of the circular economy that can be integrated into production processes. Focusing on sustainability awareness, value thinking, and the circular mindset, this certification provides professionals with the essential knowledge to begin integrating circular strategies into wood manufacturing practices.
		9.2	Circular Economy Strategy	Foundations of Circular Economy Strategy	This micro credential certifies knowledge of the fundamental steps required to develop a Circular Economy strategy. Learners will explore key steps, frameworks, and practical approaches to transitioning from linear to circular business models. This certification equips professionals with the skills to design and implement effective circular strategies, driving sustainability and resource efficiency within their organisations.
		9.3	Step 1. Assessment and goal setting	Circular Assessment and Goal Setting	This micro credential certifies knowledge of how to assess existing business to identify inefficiencies and opportunities for circularity. Learners will explore methodologies for evaluating sustainability performance, setting clear circular economy objectives, and developing actionable strategies aligned with sustainability goals. The course also covers technology watch systematic strategy to support continuous monitoring. This certification equips professionals with the skills to drive circular transformation and enhance resource efficiency within their organisations.
		9.4	Step 2. Redesign products and processes for circularity	Monitoring and assessing circularity	This micro credential certifies knowledge of key circular indicators and assessment tools used to evaluate and track circularity within a company. Learners will explore methodologies for measuring resource efficiency, waste reduction, and overall circular performance, ensuring alignment with sustainability objectives. This certification equips professionals with the skills to implement data-driven strategies, monitor progress, and drive continuous improvement in circular economy practices.
		9.5	Step 3. Monitoring and assessing circularity	Monitoring and assessing circularity	This micro credential certifies knowledge of key circular indicators and assessment tools used to evaluate and track circularity within a company. Learners will explore methodologies for measuring resource efficiency, waste reduction, and overall circular performance, ensuring alignment with sustainability objectives. This certification equips professionals with the skills to implement data-driven strategies, monitor progress, and drive continuous improvement in circular economy practices.
		9.6	Standards for circularity	Standards for Circular Economy in the Furniture Industry	This micro credential certifies expertise in knowing and applying ISO 59000 and other relevant standards to circular economy practices in the furniture industry. Learners will gain insights into regulatory frameworks, industry best practices, and practical implementation strategies to enhance sustainability and compliance. This certification empowers professionals to integrate standardized circular economy principles, improve resource efficiency, and drive sustainable innovation within their organisations.

D4.1 Definition of CETM Joint Curricula Report

CETM micro credentials mapped to the *Closing* module

MOD #	MODULE NAME	PILL #	PILL TITLE	MICRO CREDENTIAL TITLE	MICRO CREDENTIAL DESCRIPTION
10	Closing	10.1	Wrapping up and future directions	Circular Transition: Key Insights and Future Perspectives	This micro credential certifies knowledge of the key lessons learned throughout the circular transition journey while exploring future sustainability developments. Learners will reflect on essential takeaways, assess current limitations, and identify emerging trends that will shape the future of circular economy practices. This certification equips professionals with the insights needed to anticipate challenges, adapt to evolving sustainability frameworks, and drive continuous innovation in their industries.



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