

European Raw Materials Academy and European Advanced Materials Academy

AI-Ready Education: Practical, Clear, and Learner-Tested Approaches

This programme equips educators and training contributors with practical, evidence-informed strategies to support effective teaching and assessment in learning environments where AI is present. Participants learn how to develop clear AI-use policy statements, adjust assignments and assessments to maintain transparency, and apply instructional design approaches that preserve learner thinking and fairness. Through structured lessons, realistic examples, and guided reflection, the programme emphasizes practical application rather than theoretical discussion alone. Upon successful completion, participants demonstrate foundational competency in AI-aware learning design and readiness to implement these principles in professional education and training contexts.

European Raw Materials Academy & European Advanced Materials Academy
EIT RawMaterials
Knesebeckstraße 62
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Germany

For external use: Outlines the structure, learning outcomes, workload, and assessment methods.

Summary

Training Title:

AI-Ready Education: Practical, Clear, and Learner-Tested Approaches

Training Description

This course supports educators who want clear, realistic ways to support learning effectively in a world where AI is already present. Rather than focusing on tools, detection, or sweeping bans, the course centres on small, thoughtful adjustments that protect learning, fairness, and transparency.

You'll learn how to write a clear, usable AI-use policy, make targeted assignment and assessment adjustments that keep learner thinking visible, and apply practical examples drawn from real teaching and learning contexts. Throughout the course, the focus is on judgment, explanation, and learning design, rather than enforcement or monitoring strategies.

The course is structured across five lessons and takes approximately 4.5 hours to complete, depending on pace and depth of engagement. An accompanying workbook runs alongside the course, helping you translate ideas into action as you go. It provides prompts, examples, and space to adapt course concepts to your own educational content and context, so you are actively thinking about how you will use the strategies you learn.

The course includes a final knowledge assessment, which checks understanding of the core concepts introduced across the lessons. Successful completion of the assessment confirms that you have met the course's foundational knowledge and reasoning expectations.

By the end of the course, you'll leave with a concrete, workable plan you can apply immediately, along with shared language and strategies that reduce confusion, lower workload, and support confident, transparent teaching in AI-present learning environments. Upon successful completion, you will be issued a Certificate of Foundational Competency in AI-Ready Education, confirming your demonstrated understanding of AI-aware learning design and assessment principles.

For the EU Raw & Advanced Materials Academies, this course contributes to a shared approach for addressing skills development in a rapidly changing technological landscape. It supports consistent, high-quality learning design across Academy-aligned training while remaining adaptable to different sectors, roles, and learning contexts within Europe's raw and advanced materials ecosystems. The Academies and their support teams are available to assist training contributors and learners with questions related to interpretation, application, and practical implementation of the strategies introduced in this course.

AI-Use Policy Statement: AI tools may be used throughout this course as part of your learning process. You may use them to explore ideas, outline possibilities, test interpretations, or refine language. However, this course is designed to strengthen your investigative and critical thinking. If

AI is used to complete assessments or generate final responses on your behalf, it may undermine your own learning and weaken the purpose of the evaluation. Final submissions are intended to demonstrate your understanding, judgment, and reasoning. Use AI to support your thinking, not to replace it, and ensure that your final work demonstrates your own understanding.

Training Objectives:

- *Understand foundational concepts and terminology for AI-aware education.*
- *Recognize how AI is already present in everyday educational contexts.*
- *Identify common challenges and points of friction that AI introduces in learning environments.*
- *Explore the value of making small, clear adjustments rather than large-scale changes.*
- *Understand the purpose of AI-use policy statements.*
- *Apply criteria to distinguish effective from ineffective AI-use policy features.*
- *Analyse examples of strong and weak policy statements.*
- *Draft your own classroom-ready AI-use statement.*
- *Identify assignments and assessments that need AI-related adjustments.*
- *Map practical, small adjustments that make learner thinking more visible.*
- *Analyse concrete examples of effective assignment and assessment adjustments.*
- *Revise an assignment element to better surface understanding when AI is present.*
- *Analyse research-based examples of evolving AI integration.*
- *Evaluate AI adaptation options to choose effective assignment and assessment adjustments.*
- *Adapt ideas to your own teaching context to develop strategies that work best in your educational context.*

Training name:	AI-Ready Education: Practical, Clear, and Learner-Tested Approaches					
Training year:	2026	Module code:	AI READY	ECTS: 0		
Trainers:	Dr. Alison Opalko, EIT RawMaterials					
Training Level:	Intermediate					
Language of training:	English		Topic/ Subject:	ELOs 2 & 6	Length:	6.5 hrs
Prerequisites	None		Target Trainee:	Instructors, trainers, and subject matter experts who design or deliver professional education and workforce training in the raw and advanced materials sectors	Certificate:	Certificate of Foundational Competency in AI-Ready Education
Website:	EIT RawMaterials Learning Management System					
Associated ESCO codes:	e-learning; learning technologies; develop e-learning plan; develop learning curriculum; construct individual learning plans; develop educational resources; advise on learning methods; use learning strategies; use e-services; using digital tools for collaboration, content creation and problem solving; working with computers; principles of artificial intelligence; apply teaching strategies; instructional design models; instructional strategies; develop digital educational materials; assessment processes; curriculum objectives;					

Training Description

Training description towards the achievement of Raw Materials Value Chain/EIT ELO alignment

Description of training in terms of Raw Materials Value Chain or EIT OLOs achievements

Trainee who has passed the training knows and understands/can/is ready to:	Description of capability gained	link with Raw Materials Value Chain Stage [Stage - X] or EIT OLOs (OLO – X)	Method of verification and assessment of learning outcomes (e.g., final exam, project, presentation, etc.)	The 8-level framework is based on EQF levels and alignment with the EIT Overarching Learning Outcomes (OLOs) or Raw Materials Value Chain as applicable.
1 Knows	foundational concepts, terminology, and principles of AI-aware education, including the purpose and structure of AI-use policies and assignment adjustments.	ELO 2 – Innovation and Technology Skills and Competencies	Final assessment	
2 Is ready to	ready to draft clear AI-use policy statements and implement practical adjustments to assignments and assessments that maintain transparency and support learner understanding.	ELO 2 – Innovation and Technology Skills and Competencies	Final assessment	
3 Understands and has awareness regarding	how AI is present in educational contexts, the challenges it introduces, and the importance of maintaining fairness, transparency, and learner thinking visibility.	ELO 2 – Innovation and Technology Skills and Competencies	Final assessment	
4 Can discuss	effective and ineffective AI-use policy features, assignment design approaches, and practical strategies for supporting learning in AI-present environments.	ELO 2 – Innovation and Technology Skills and Competencies	Final assessment	
5 Can assess	assignments, assessment elements, and policy statements	ELO 2 – Innovation and	Final assessment	

	to determine whether they effectively support learner understanding and maintain visibility of learner reasoning.	Technology Skills and Competencies	
6	Can present clear AI-use policy statements and explain assignment and assessment adjustments that support transparent and effective learning design.	ELO 6 – Leadership Skills and Competencies	Final assessment
7	Become familiar with research-based examples, practical adjustment strategies, and real-world approaches to integrating AI awareness into teaching and learning design.	ELO 2 – Innovation and Technology Skills and Competencies	Final assessment
8	Gains practical strategies, shared language, and a concrete plan to adapt teaching, assignments, and assessments for AI-present learning environments.	ELO 2 – Innovation and Technology Skills and Competencies	Final assessment

Trainee Workload

This table outlines the total workload required for trainees to complete the training, measured in both hours and ECTS credits. The breakdown includes formal training sessions, independent study, preparation for practical activities, additional contact hours with trainers, and other relevant activities. ECTS credits are calculated based on the total number of hours dedicated to learning activities, following the standard conversion rate of 1 ECTS = 25 hours of workload.

TRAINEE'S WORKLOAD (ECTS CREDIT BALANCE)

TRAINEE ACTIVITY DURING THE TRAINING	Trainee ECTS [First, complete the table below. Then, insert the total trainee workload hours converted to ECTS credits, using the standard rate of 1 ECTS = 25 hours.]
TRAINING TIME (SUM)	6.5 hrs
OFFLINE PREPARATION BEFORE TRAINING CLASSES	N/A
OFFLINE PREPARATION OF FOR PRACTICAL ACTIVITIES/EXAMS (GROUP PROJECTS)	N/A



OFFLINE INDEPENDENT STUDY OF THE SUBJECT OF TRAINING	1 hr
ADDITIONAL CONTACT HOURS WITH TRAINER	N/A
OTHER	1 hour
TOTAL TRAINEE WORKLOAD [HOURS]	6.5 hours

ECTS Credits Per Module

ECTS credits are an essential aspect of Skills Hub trainings, providing trainees with a measurable and transferable way to demonstrate their learning achievements. By completing modules with assigned ECTS credits, trainees can showcase their educational achievements in relation to the European Qualifications Framework (EQF). This system ensures compatibility with higher education standards across Europe, enhancing the recognition of qualifications obtained through EIT RawMaterials' Academies for lifelong learning training.

Calculation of ECTS credits based on the total workload hours, following the standard rate of 1 ECTS = 25 hours of learning activity.

Module Name	ECTS Credits	Description
Module 1: Recognizing Where AI Already Shapes Education	0	This lesson helps you take an honest, grounded look at how AI is already showing up in education, which often happens in ways that may be difficult to notice, are uneven, or are difficult to talk about. Rather than asking you to become an AI expert or redesign your entire curriculum, this lesson focuses on recognizing current realities and identifying common points of friction that many educators and learning contributors are experiencing. By understanding where and why AI creates uncertainty, you can begin making small, intentional adjustments that restore clarity, fairness, and confidence in your educational practice. The goal is not to “keep up” with AI, but to design learning that still works well when AI is present by starting from where you are right now. The accompanying workbook supports this lesson by giving you space to pause, reflect, and apply the ideas

		to your own context. The activities are designed to help you surface where AI is already influencing your teaching, assessment, or content creation, and to capture practical next steps you can use immediately. Clear objectives help you focus your learning and connect new ideas to your own context, whether you teach, train, design learning activities, contribute content, or support assessment.
Module 2: Crafting Clear, Adaptable AI-Use Policy Statements	0	Welcome to this lesson on crafting clear, adaptable AI-use policy statements for learning contexts where AI is already present. As AI becomes a regular part of teaching and learning, having shared, actionable expectations is essential for reducing uncertainty and supporting both learning and fairness. Rather than serving as legal documents or blanket rules, well-designed AI-use statements clarify what is allowed, what learners are responsible for, and why these expectations exist in relation to learning goals. This helps reduce confusion, supports transparency, and shifts the focus away from enforcement and toward learning. The accompanying workbook supports this lesson by guiding you step by step through the process of drafting and refining your own AI-use policy statement. It offers prompts, examples, and space to tailor expectations to your specific educational context. Clear objectives help you stay focused and make the most of this lesson. By knowing what you'll accomplish, you can better connect new ideas to your own teaching or learning context and begin applying them with confidence.
Module 3: Adjusting Assignments and Assessments	0	As AI becomes a regular part of learners' experiences, it's essential to reconsider how assignments and assessments are designed. This lesson will help you make thoughtful adjustments so that understanding, reasoning, and growth remain visible and meaningful, even when AI tools are available.

You'll explore practical, manageable ways to adjust assignments, so they continue to support authentic learning, fairness, and clarity, without requiring a complete redesign.

The accompanying workbook supports this lesson by helping you work through these adjustments in your own context. It provides guided prompts and examples to help you identify where assignments may be vulnerable to AI use and to plan small, targeted changes that keep learner thinking visible.

Understanding the objectives of this lesson will help you stay focused and connect new ideas to your own teaching or learning context. These goals will guide you as you apply practical strategies for designing assignments and assessments that continue to surface genuine understanding when AI is present.

Module 4: Learning from Practice 0

Welcome! This lesson is all about learning from practical, research-based examples of AI integration in teaching. By reflecting on real scenarios, you can see what works, identify where challenges tend to arise, and adapt the ideas to your own learning context to build a supportive, functional educational practice in a world where AI is readily available to learners.

The accompanying workbook supports this lesson by giving you space to translate insights into concrete actions for your own educational design.

Understanding the objectives of this lesson will help you approach the examples with purpose. By knowing what to look for, you can better connect each scenario to your own context and leave with strategies you can apply with clarity and confidence.

Module 4: Creating Your AI-Ready Teaching Plan 5

Welcome to the final lesson! You've made significant progress in understanding and designing AI-aware teaching practices. Now it's time to bring your plans into action by finalizing your AI-use policy, assignment, and assessment adjustments, and preparing to share and reflect with colleagues. This lesson focuses on

moving from planning to implementation and ongoing collaboration, so your work leads to real, sustainable impact in practice.

The accompanying workbook supports this final step by helping you consolidate your decisions, document your finalized approaches, and outline concrete next steps. It also provides space to prepare talking points and reflection prompts for peer discussion, making it easier to share your ideas.

Understanding the objectives of this lesson will help you prioritize what to finalize now and what to revisit later. By keeping the goals in view, you can focus your energy on actions that strengthen clarity, consistency, and confidence as you move forward.

Methods & Techniques of Training Education

Methods and techniques of training education

[Description of the instructional methods and techniques used to deliver the training content effectively, including teaching methods (e.g., lectures, workshops, case studies, e-learning modules), practical activities (e.g., hands-on exercises, simulations, lab work), learning tools (e.g., multimedia presentations, reading materials, industry-relevant tools and software), and guidance (e.g., feedback offered in the training and mechanisms for feedback).]

Conditions
and
methods of
passing for
admission
to the
training
exam/
assessment

Prerequisites: Not applicable

Assessment Methodology

The assessment is conducted through an online knowledge assessment consisting of multiple-choice, multiple-select, and matching question formats. Assessment items are directly aligned with the course lessons and include both knowledge-based questions and realistic teaching scenarios that require application of AI-aware learning design and assessment principles. Multiple-select questions require trainees to identify all correct responses to receive credit. The assessment evaluates understanding, reasoning, and the ability to apply course concepts in practical contexts. Trainees may review course materials while completing the assessment, and successful completion requires achieving the minimum passing score defined in the training requirements.

Passing Criteria

Trainees successfully pass the training by achieving a minimum score of greater than 80% on the final knowledge assessment. This assessment evaluates their

understanding of the core concepts presented in the course, including AI-aware learning design, AI-use policy principles, and practical assignment and assessment adjustments. A passing score confirms that the trainee has demonstrated sufficient knowledge and reasoning ability to recognize how AI affects learning environments and to apply course principles to realistic teaching and learning scenarios. Upon achieving a passing score, the trainee is considered to have met the training requirements and is awarded the Certificate of Foundational Competency in AI-Ready Education.

Retake and Remediation Policy

Trainees who do not achieve the required passing score of greater than 80% on the assessment are permitted to review the relevant course lessons, examples, and supporting workbook materials to reinforce their understanding of the core concepts. Trainees may then retake the assessment, with up to three total attempts allowed to achieve a passing score. The assessment is designed to support learning and understanding, and trainees are encouraged to revisit lesson content and reflect on practical applications before retrying. If technical issues or assessment clarity concerns affected performance, trainees may also request a formal review or reassessment opportunity in accordance with the Academies' assessment review and appeal procedures.

Appeal Process

Assessment Review & Appeal Process

If you believe that an assessment result does not accurately reflect your understanding of the required content, you may request a formal review.

An appeal may be submitted in cases where you believe that:

- A question was unclear, ambiguous, or misleading
- The assessment item did not accurately reflect the module content
- A technical issue affected your ability to complete the assessment

Appeals must be submitted within 10 working days of receiving your assessment result and must clearly state the reason for the request. Please email academy@eitrawmaterials.eu or the instructor at alison.opalko@eitrawmaterials.eu

What Happens Next

Appeals are reviewed by the Academies' Education team or a designated quality reviewer who was not involved in the original assessment design or delivery.

The review focuses on the assessment items and scoring logic, not on regrading based on partial knowledge or alternative interpretations outside the module content.

You may be asked to provide additional clarification or supporting information related to your appeal.

Possible Outcomes

Following review, one of the following outcomes will apply:

- The original result is confirmed
- A scoring correction is applied
- A reassessment opportunity is granted for the affected item(s)

All appeal decisions are final and are communicated in writing.

Minimum mandatory attendance to pass the training

This is a self-paced online course. Attendance is demonstrated solely through completion of all required online modules and the final assessment. No live participation or time-based attendance is required. Completion is monitored through the learning management system, which records module completion and assessment submission. Trainees who do not complete all required components are considered not to have met the attendance requirement and are therefore not eligible to complete the course or receive a certificate. In exceptional circumstances, trainees may contact the Education team to request consideration; such requests are reviewed on a case-by-case basis.

Appendix B

Understanding Skills and Capability Levels in the Raw Materials Value Chain

The Skills and Capability Levels (A-D) in this appendix correspond to the European Qualifications Framework (EQF) levels, which classify learning outcomes based on knowledge, skills, and autonomy.

Each EQF level can be grouped into pairs, distinguishing between theoretical knowledge and factual/practical knowledge. The table below illustrates how the Skills and Capability Levels (A-D) align with EQF levels:

Skills and Capability Level	Corresponding EQF Levels	Description
A (Expert)	Levels 7-8	Highly specialized or cutting-edge knowledge, leadership in innovation, and strategic decision-making, and the ability to train and mentor others in these domains.
B (Advanced)	Levels 5-6	Comprehensive knowledge, ability to lead projects, and apply advanced problem-solving skills.
C (Intermediate)	Levels 3-4	Solid understanding, ability to analyse data, suggest improvements, and apply basic principles with some autonomy.
D (Basic)	Levels 1-2	Foundational understanding, ability to carry out simple tasks under supervision.

This framework ensures that each stage of the Raw Materials Value Chain is aligned with progressive learning levels, supporting the development of sustainable resource management, circular economy principles, and industry best practices.

Raw Materials Value Chain Stage	Description	Skills and Capability levels	Description
Stage 1 - Exploration	The ability to conduct geological investigations to identify mineral deposits and undertake resources and reserves assessments, ensuring responsible sourcing principles and championing ESG aspects.	A (Expert)	The trainee has mastered geological assessment techniques, integrating field work, geochemical and geophysical investigations with ESG and economic factors into resource exploration. They can develop exploration policies and strategies, optimize raw material discovery and report results according to industry standards, including PFS and FS, and train others in applying these methods and standards.

		B (Advanced)	The trainee can evaluate exploration strategies, resource assessment, and lead projects that improve responsible mining practices.
		C (Intermediate)	The trainee can analyze geological data, identify potential raw material sources, and apply basic exploration principles.
		D (Basic)	The trainee understands the fundamentals of geological exploration, resource assessment, and the role of raw materials in industrial applications.
Stage 2 - Mining	The ability to apply responsible and innovative mining techniques that minimize environmental impact, ensure worker safety, and optimize resource efficiency.	A (Expert)	The trainee has mastered advanced mining methodologies, integrating technical, environmental, ethical, and safety considerations into large-scale extraction processes, and is able to use circular economy principles in mining waste valorisation, and can train others in the application of these practices
		B (Advanced)	The trainee can assess mining operations, implement responsible extraction strategies, and lead projects that improve resource efficiency and safety.
		C (Intermediate)	The trainee can evaluate mining techniques, identify sustainability challenges, and propose basic improvements to reduce environmental impact.
		D (Basic)	The trainee understands the core concepts of responsible mining, including resource efficiency, safety, environmental impact, and regulatory compliance.
Stage 3 - Mineral Processing	The ability to optimize material processing and refining techniques to increase efficiency, reduce waste, and enhance circularity in the raw materials supply chain.	A (Expert)	The trainee has mastered advanced refining techniques, integrating energy-efficient processes, waste reduction strategies, and continuous improvement practices in material processing. They are skilled in optimizing operations to increase yield and enhance overall process efficiency, and are capable of training others in these techniques and strategies..
		B (Advanced)	The trainee can design and evaluate refining methods, optimize material efficiency, and implement sustainable processing innovations.
		C (Intermediate)	The trainee can assess processing techniques, apply basic principles of refining efficiency, and identify opportunities for sustainability improvements.

		D (Basic)	The trainee understands fundamental material processing and refining concepts, including efficiency, sustainability, and regulatory requirements.
Stage 4 - Materials Processing	The ability to process raw minerals in a safe, competitive and sustainable way.	A (Expert)	The trainee has mastered sustainable material transformation techniques, integrating waste minimization as well as water and energy consumption efficiency into processing workflows. They can develop and implement sustainability-driven strategies (e.g., industrial symbiosis) to enhance operational performance, and can train others in applying these approaches.
		B (Advanced)	The trainee can assess material transformation processes, propose improvements in processing efficiency, including water and energy consumption, and implement sustainability-driven strategies (e.g., industrial symbiosis).
		C (Intermediate)	The trainee can evaluate processing workflows, identify areas for improvement, and apply basic efficiency principles.
		D (Basic)	The trainee understands the fundamentals of materials processing, including refining steps, energy use, and efficiency considerations.
Stage 5 - Product Design	The capability to integrate sustainable materials into product design, optimizing material efficiency, durability, and recyclability.	A (Expert)	The trainee has mastered sustainable product design and LCA methodologies, ensuring minimal resource waste and integrating circular economy principles into manufacturing, and is able to train others in these methods and principles.
		B (Advanced)	The trainee can assess material selection, design for sustainability, and optimize manufacturing processes to reduce environmental impact.
		C (Intermediate)	The trainee can apply basic sustainable design principles, identify material efficiency improvements, and evaluate lifecycle impacts.
		D (Basic)	The trainee understands the fundamentals of sustainable product design, including material selection, durability, and recyclability.
Stage 6 - Manufacturing	The ability to produce finished goods from raw materials while optimizing material use and reducing	A (Expert)	The trainee has mastered sustainable manufacturing methodologies, ensuring minimal resource loss and integrating circular economy principles.

	waste through innovative and evolving technologies and techniques.	B (Advanced)	The trainee can assess production workflows, optimize for material efficiency, and lead projects that reduce environmental impact.
		C (Intermediate)	The trainee can analyze manufacturing processes, identify areas for improvement, and apply basic efficiency strategies.
		D (Basic)	The trainee understands the fundamentals of manufacturing, including material use, energy consumption, and sustainability considerations.
Stage 7 - Product Use and Reuse	The ability to extend product lifecycles, enhance resource efficiency, and integrate circular economy principles into industrial and workforce systems.	A (Expert)	The trainee has mastered circular economy strategies, leading large-scale implementation efforts to maximize product lifespan and minimize waste, and is capable of training others in the development and execution of these strategies.
		B (Advanced)	The trainee can develop sustainability initiatives, assess circular economy frameworks, and implement resource-efficient strategies at scale.
		C (Intermediate)	The trainee can evaluate sustainability metrics, identify circularity opportunities, and propose improvements in material use.
		D (Basic)	The trainee understands fundamental sustainability principles, including waste minimization, resource conservation, and lifecycle thinking.
Stage 8 - 9 Collection/ Recycling	The ability to design, implement, and optimize efficient collection and recycling systems to enhance raw material recovery, reduce waste, and promote circularity in the supply chain.	A (Expert)	The trainee has mastered advanced collection and recycling techniques, integrating efficiency improvements, sustainability strategies, material recovery, and waste reduction into operational processes, and can train others in implementing these techniques effectively.
		B (Advanced)	The trainee can design, evaluate, and implement collection and recycling programs, optimize material flows, and apply sustainability-driven strategies to enhance efficiency and circularity.
		C (Intermediate)	The trainee can assess collection and recycling workflows, identify efficiency improvements, and apply basic principles of material recovery and waste management.
		D (Basic)	The trainee understands fundamental collection and recycling principles, including material recovery, waste management, and regulatory requirements.

Understanding Skills and Capability Levels in the EIT Overarching Learning Outcomes (OLOs)

The Skills and Capability Levels (A-D) used in this appendix align with the European Qualifications Framework (EQF), ensuring that learning outcomes correspond to recognized levels of knowledge, skills, and autonomy.

Each EQF level can be grouped into pairs, distinguishing between theoretical knowledge and factual/practical knowledge. The table below illustrates how the Skills and Capability Levels (A-D) align with EQF levels:

Skills and Capability Level	Corresponding EQF Levels	Description
A (Expert)	Levels 7-8	Highly specialized or cutting-edge knowledge, leadership in innovation, and strategic decision-making, and the ability to train and mentor others in these domains.
B (Advanced)	Levels 5-6	Comprehensive knowledge, ability to lead projects, and apply advanced problem-solving skills.
C (Intermediate)	Levels 3-4	Solid understanding, ability to analyze data, suggest improvements, and apply basic principles with some autonomy.
D (Basic)	Levels 1-2	Foundational understanding, ability to carry out simple tasks under supervision.

This alignment ensures that the EIT Overarching Learning Outcomes (OLOs) reflect progressive learning levels, supporting the development of entrepreneurial, technological, intercultural, sustainability, and leadership competencies in a structured and measurable way.

EIT OLOs	Description	Skills and Capability levels	Description
ELO 1 - Entrepreneurship Skills and Competencies	The ability to identify and act upon opportunities and ideas to create social, cultural and financial value for others and oneself.	A (Expert)	The trainee has mastered entrepreneurial strategy, can develop and execute scalable and sustainable business models, and lead high-impact ventures that create economic, social, and cultural value. They can navigate funding, investment, and policy landscapes to drive innovation.
		B (Advanced)	The trainee can assess market opportunities, evaluate risks, and develop business plans that align with sustainability and innovation.

			They can identify and act on new value-creation opportunities in real-world business and social contexts.
		C (Intermediate)	The trainee can analyze entrepreneurial challenges, recognize potential business and social innovation opportunities, and apply basic principles of business development, including resource allocation, customer needs, and risk assessment.
		D (Basic)	The trainee understands fundamental entrepreneurial concepts, including opportunity recognition, value creation, and financial risk assessment. They can identify early-stage ideas with potential for impact but require further guidance to develop them into viable ventures.
ELO 2 - Innovation and Technology Skills and Competencies	The ability to use knowledge, ideas and technology to create new or improve existing products, services, processes as well as policies, business models and jobs. Where relevant, the ability to mobilise system innovation for broader workforce change, while evaluating the unintended consequences of innovation and technology.	A (Expert)	The trainee has mastered the application of emerging and advanced technologies, leading R&D initiatives and complex projects to drive breakthrough innovations across industries and society. They can develop and implement system-level innovations, integrate effective project management practices, solve complex problems, and critically evaluate their long-term impact while mitigating unintended consequences.
		B (Advanced)	The trainee can assess, adapt, and implement innovative technologies to improve existing products, services, or processes. They can identify scalable innovations, lead projects, apply structured problem-solving methods, and contribute to technological, economic, and workforce advancements.
		C (Intermediate)	The trainee can evaluate innovation opportunities, propose technological solutions, and contribute to development projects by enhancing efficiency and effectiveness. They can apply basic project management principles, recognize the role of business models and policy frameworks, and use problem-solving techniques to address challenges.
		D (Basic)	The trainee understands fundamental innovation processes, including ideation, prototyping, technology adoption, and problem-solving. They can describe how new

			and existing technologies can be used to improve products, services, or processes and can participate in structured projects with guidance.
ELO 3 - Creativity Skills and Competencies	To ability to think beyond boundaries and systematically explore and generate new ideas.	A (Expert)	The trainee has mastered creativity in problem-solving, leading cross-functional teams in designing disruptive innovations. They can systematically apply advanced creativity methodologies to push beyond conventional thinking and drive transformational change.
		B (Advanced)	The trainee can apply design thinking, lateral thinking, and structured ideation techniques to generate novel and impactful solutions. They can challenge existing models, iterate rapidly, and refine ideas into viable innovations.
		C (Intermediate)	The trainee can recognize creative approaches, propose original ideas, and contribute to collaborative innovation projects. They can use structured brainstorming and problem-framing techniques to improve idea generation.
		D (Basic)	The trainee understands fundamental creativity principles, including brainstorming, conceptual thinking, and exploring alternative perspectives. They can participate in ideation sessions and contribute new perspectives to discussions.
ELO 4 - Intercultural Skills and Competencies	The ability to engage and act internationally and to function effectively across cultures, sectors and/or organisations, to think and act appropriately and to communicate and work with people from different cultural and organisational backgrounds	A (Expert)	The trainee has mastered intercultural leadership, effectively managing global teams and integrating diversity and inclusion strategies into business and organizational policies. They can mediate complex intercultural interactions, resolve conflicts, and develop inclusive policies and practices.
		B (Advanced)	The trainee can navigate cultural differences, communicate effectively in international and cross-sector environments, and lead cross-cultural collaborations. They can apply intercultural intelligence to improve team dynamics, partnerships, and stakeholder engagement.
		C (Intermediate)	The trainee can analyze intercultural challenges, adapt to diverse environments, and apply cultural awareness strategies in

			professional settings. They can recognize biases, address misunderstandings, and contribute to a more inclusive work environment.
		D (Basic)	The trainee understands fundamental intercultural concepts, including cultural sensitivity, communication norms, and workplace diversity. They can identify key cultural differences and participate in cross-cultural interactions with basic awareness.
ELO 5 - Making Value Judgments and Sustainability Competencies	To ability to identify the consequences of plans and decisions and to merge this into a solution-focused approach that moves towards a sustainable and green society.	A (Expert)	The trainee has mastered sustainable decision-making, designing policies and strategies that balance economic, environmental, and social factors. They can anticipate long-term consequences, implement systemic change, and drive sustainability at an organizational, governmental, or global level.
		B (Advanced)	The trainee can assess sustainability challenges, evaluate environmental and social trade-offs, and implement responsible business practices. They can develop and advocate for long-term sustainability solutions in industry, policy, or community initiatives.
		C (Intermediate)	The trainee can analyze ethical dilemmas, identify sustainability-driven improvements, and engage in responsible decision-making. They can apply basic sustainability principles to develop practical solutions in professional settings.
		D (Basic)	The trainee understands the fundamental principles of ethics, sustainability, and corporate responsibility. They can recognize the potential consequences of decisions and apply basic sustainability considerations in daily activities.
ELO 6 - Leadership Skills and Competencies	To ability make decisions and provide leadership based on a holistic understanding of the contributions of education, research and business to value creation.	A (Expert)	The trainee has mastered leadership in complex environments, implementing strategic visions and driving organizational transformation. They can integrate education, research, and business to develop innovative, value-driven strategies at local, national, or global levels.
		B (Advanced)	The trainee can manage teams, make strategic decisions, and drive innovation within an organization. They understand how



			to leverage research and education to enhance business and social impact.
		C (Intermediate)	The trainee can take initiative, solve problems, and support decision-making processes within teams. They understand the role of leadership in bridging research, education, and business to create practical value.
		D (Basic)	The trainee understands fundamental leadership principles, including team dynamics, problem-solving, and decision-making. They recognize the interconnection between education, research, and business in leadership roles.

Understanding Skills and Capability Levels in the Advanced Materials Value Chain

The Skills and Capability Levels (A-D) in this appendix correspond to the European Qualifications Framework (EQF) levels, which classify learning outcomes based on knowledge, skills, and autonomy.

Each EQF level can be grouped into pairs, distinguishing between theoretical knowledge and factual/practical knowledge. The table below illustrates how the Skills and Capability Levels (A-D) align with EQF levels:

Skills and Capability Level	Corresponding EQF Levels	Description
A (Expert)	Levels 7-8	Highly specialized or cutting-edge knowledge, leadership in innovation, and strategic decision-making, and the ability to train and mentor others in these domains.
B (Advanced)	Levels 5-6	Comprehensive knowledge, ability to lead projects, and apply advanced problem-solving skills.
C (Intermediate)	Levels 3-4	Solid understanding, ability to analyse data, suggest improvements, and apply basic principles with some autonomy.
D (Basic)	Levels 1-2	Foundational understanding, ability to carry out simple tasks under supervision.

This framework ensures that each stage of the Advanced Materials Value Chain is aligned with progressive learning levels, supporting the development of sustainable innovation, circular design, and industry best practices across material classes.

Advanced Materials Value Chain Stage	Description	Skills and Capability levels	Description
Stage 1 - Design, Development and Production	The ability to conceptualize, design, synthesize, and scale up advanced materials with tailored properties, integrating experimental, computational, and manufacturing approaches.	A (Expert)	The trainee has mastered the end-to-end design and synthesis of advanced materials, integrating computational modelling, AI-driven discovery, and advanced manufacturing. They can lead R&D programs, define sustainability criteria, and train others in cross-disciplinary materials innovation.
		B (Advanced)	The trainee can design and evaluate new materials, optimize performance for specific applications, and lead laboratory or pilot-scale production integrating safety and environmental standards.
		C (Intermediate)	The trainee can conduct experimental or computational tests, characterize material properties, and apply established design methods to improve performance.
		D (Basic)	The trainee understands the fundamental principles of material composition, structure, and property relationships, and can assist in basic laboratory or prototyping activities under supervision.
Stage 2 - Transformation & Integration into Components, Products & Systems	The ability to integrate advanced materials into engineered systems and industrial products, applying design-for-manufacture and life-cycle principles.	A (Expert)	The trainee has mastered systems-level integration, leading cross-sector teams to embed advanced materials into complex products and infrastructures. They can align material performance with functional, regulatory, and sustainability requirements across value chains.
		B (Advanced)	The trainee can assess and implement processing and integration methods (e.g., additive manufacturing, coatings, composites), optimizing performance and reliability.
		C (Intermediate)	The trainee can interpret design specifications, apply integration procedures, and evaluate compatibility of materials and processes.
		D (Basic)	The trainee understands the general concepts of material transformation and can assist in assembly, fabrication, or quality-control tasks under guidance.
Stage 3 - Use Phase (Monitoring,	The ability to deploy advanced materials in real-world systems, monitor their	A (Expert)	The trainee has mastered digital-twin and predictive-maintenance methodologies, leading performance optimization strategies across

Repairing and Performance Management)	behavior, and apply maintenance or repair strategies to extend functional lifetime.		product lifecycles. They can design monitoring systems and translate performance data into innovation feedback loops.
		B (Advanced)	The trainee can evaluate in-service material performance, apply condition-monitoring techniques, and recommend repair or replacement strategies to ensure sustainability and reliability.
		C (Intermediate)	The trainee can apply standard inspection and maintenance procedures, collect and interpret data from sensors or non-destructive testing, and report anomalies.
		D (Basic)	The trainee understands the basic principles of material degradation, inspection, and safe handling, and can follow maintenance protocols under supervision.
Stage 4 - Recovery & Recycling of Advanced Materials	The ability to recover, separate, and reintegrate advanced materials at end-of-life, enabling circularity, resource efficiency, and reduced environmental impact.	A (Expert)	The trainee has mastered circular design principles and recovery technologies, integrating material passports, traceability, and lifecycle assessment into product and policy frameworks. They can lead system-level recycling innovation.
		B (Advanced)	The trainee can assess and implement recycling and re-manufacturing processes for advanced materials, optimizing recovery rates and energy efficiency while ensuring compliance with environmental standards.
		C (Intermediate)	The trainee can evaluate waste-handling workflows, apply standard separation and re-use methods, and identify opportunities for process improvement.
		D (Basic)	The trainee understands basic recycling and waste-management concepts and can participate in safe handling, sorting, and processing activities.