

Service Description

Development of Training Courses for the European Materials Sector

Lot 5 - IoT and Smart Manufacturing

1. Overview

1.1. *EU Raw Materials Academy*

The **European Raw Materials Academy (RMA)** and the **European Advanced Materials Academy (AMA)** are flagship initiatives funded by the European Commission to support the upskilling and reskilling of Europe's raw and advanced materials workforces. In response to growing demands for sustainability, digitalisation, and industrial resilience, the Academy aims to close critical skills gaps across the entire materials value chain — from exploration and processing to recycling and circularity, and substitution using advanced materials. Designed to serve professionals, SMEs, large enterprises, and public authorities alike, the Academy projects will offer a portfolio of high-quality, future-oriented learning programmes aligned with evolving labour market needs and EU policy priorities, such as the Critical Raw Materials Act, the Pact for Skills, the Net Zero Industry Act, and the Green Deal Industrial Plan.

EIT RawMaterials operates these two European learning academies: the RMA, serving the raw materials sector, and the AMA, serving the advanced materials sector. Both are co-funded by the European Union and share one mission, which is to close the skills gaps that slow down Europe's materials industries. Together, the academies aim to reach an ecosystem of 300,000 learners by 2029 through a catalogue of practical, industry-oriented online courses.

1.2. *EIT Raw Materials*

EIT RawMaterials is a 'Knowledge and Innovation Community' (KIC) created by the European Institute of Innovation and Technology (EIT), aimed at promoting innovation in the raw materials sector across Europe. Established in 2015, EIT RawMaterials works to secure the sustainable supply of raw materials to the European industry by driving innovation, education, and entrepreneurship along the entire raw materials value chain.

We are a knowledge-driven business and a catalyst for industrial progress. Our offerings leverage our expertise and that of our network – the world's largest network in the raw [and advanced] materials sector – which includes companies at every stage of evolution, from start-ups to market leaders, along with leading international universities, research organisations, and top experts and future talent from the sector.

Our activities span from mining and mineral processing to material recycling and substitution, focusing on increasing resource efficiency and fostering a circular economy.

We inform policy, apply knowledge, accelerate innovation, create opportunity, and unlock commercial value – for our partners and customers throughout the raw materials value chain to develop the raw materials sector as a strategic strength and foundation for a secure, sustainable future for Europe.

Our offerings are designed to help our partners and industry to be part of Europe's strategic agenda to ensure supply chain security and make the 'Green New Deal' a reality that benefits the people of Europe and partner nations.

For more information about our company please visit the following website:

<https://eitrawmaterials.eu/>

2. Scope of work

The Academies' needs assessments identified high-priority skill gaps within eight subclusters:

- (1) Regulatory, Traceability and Compliance
- (2) Critical & Strategic Materials
- (3) Circular Economy & Sustainability
- (4) Artificial Intelligence & Machine Learning
- (5) IoT and Smart Manufacturing
- (6) Battery Materials & Energy Storage
- (7) Data & Digital Operations
- (8) Digital Twins & Simulation

The fifth subcluster is subject matter of this lot and the works and services to be performed thereunder.

2.1. *Background and objectives*

Digital transformation is one of the major skills challenges identified across both academies. The needs assessments highlight IoT, smart manufacturing, AI/ML, predictive maintenance, automation, digital twins and data analytics as interconnected capabilities required to modernise Europe's materials industries. In the Advanced Materials Academy assessment, Internet of Things (IoT) & Smart Manufacturing is identified as a HIGH-priority cluster comprising six skills, with the assessment finding no existing training coverage for the cluster among the advanced materials programmes mapped across the EU.

The demand is not limited to data scientists or digital specialists. On the raw materials side, the workforce needs to develop practical capabilities in IoT and sensor-data integration, AI-driven predictive maintenance, AI-powered inspection, process optimisation and quality control across industrial equipment and operations. The RM needs assessment explicitly identifies AI, IoT and data analytics as necessary to digitalise the raw materials value chain, from production and processing through to maintenance and optimisation.

On the advanced materials side, the skills requirements extend from the factory floor into the materials and product lifecycle. Identified gaps include IoT sensor deployment and data interpretation for materials processing, embedded sensor integration for structural health monitoring, sensor-based condition monitoring, smart factory systems, real-time quality control, predictive maintenance, and digital-thread management across the materials lifecycle. These requirements span process industries and manufacturing, as well as applications in construction, infrastructure and aerospace.

What companies lack has therefore evolved beyond general awareness of digital technologies. The gap is the practical ability to connect physical assets and production environments, collect and interpret operational data, monitor equipment and materials in real time, and use that information to improve maintenance, quality and manufacturing performance. The assessments emphasise that many of these competencies require more than theoretical knowledge: effective learning needs access to software, real or realistic industrial datasets, operational scenarios and, for higher-level competencies, sensors,

inspection equipment or production machinery.

This need is reinforced by the workforce data. In the Advanced Materials Academy survey, data analytics and materials informatics were among the leading current skill priorities for engineers and technical professionals, while AI/ML for materials R&D was identified as a future priority by 71% of respondents in this workforce segment. The assessment also identifies Industrial IoT as part of the wider digital-transformation skills landscape, alongside digital twins, AI/ML and advanced data analytics.

Our preliminary needs assessment reports are now available as whitepapers here:

Raw Materials Academy: [Raw Materials Academy needs assessment](#)

The Advanced Materials Academy Needs Assessment Report to be published soon.

2.2. Scope of Work

2.2.1 Courses to be developed

Courses under this subcluster should address one or more of the skill gaps described in Section 2.1 and should be designed for working professionals in the European raw materials and advanced materials industries. This could include workshop employees, technicians, engineers, maintenance and reliability professionals, manufacturing and process specialists, and business leadership. Graduates entering the sector and professionals in adjacent engineering, manufacturing or digital roles may be defined as secondary audiences. Policy makers could be defined as tertiary audiences.

Module content must incorporate inclusive programme design and broader diversity considerations throughout. Case studies, personas, sample datasets, imagery, video content and language should represent a gender-balanced range of practitioners and role models in technical, engineering, research and leadership roles across the raw and advanced materials sector.

Indicative themes include IoT sensor deployment and data interpretation, connected industrial equipment and systems, smart factory operations, real-time production and quality monitoring, sensor-based condition monitoring, predictive maintenance, industrial data analytics, embedded sensor integration, and digital-thread management across the materials lifecycle. Depending on the target audience and skill gaps addressed, courses may also cover applications such as structural health monitoring of advanced materials and infrastructure, AI-enabled inspection, integration of IoT data with predictive-maintenance systems, and the use of connected systems to support manufacturing process optimisation.

The Contractor is not expected to address every theme. Course content that combines or reframes them is welcome, provided the link to the identified skill gaps is clear. Learners should be enabled to apply IoT and smart-manufacturing concepts in realistic industrial contexts, rather than focusing solely on theoretical descriptions of Industry 4.0. Depending on the level of the course, this may include practical work with industrial datasets, simulations, software tools, connected-system scenarios, or sensor and equipment-based activities. The needs assessments indicate that several of the identified competencies require real industry cases or hands-on access to equipment and facilities.

Courses will be published in British English on the Academy learning platform and will form part of the joint RM Academy and AM Academy catalogue.

Platform hosting, learner recruitment and marketing, and translation into languages other than British English are outside the scope of this contract and are managed by EIT RawMaterials.

Company-specific legal advice, legal representation, the performance of formal audits, preparation or submission of permit applications, issuance of regulatory approvals and implementation of bespoke organisational IT systems are also outside scope unless expressly agreed otherwise.

Courses may teach or simulate the relevant processes, but they must not claim that course completion confirms organisational compliance or replaces advice from an appropriately qualified professional or competent authority.

2.2.2 Instruction design, modality, and technical requirements

Courses must be designed as interactive, learner-centred modules grounded in adult learning principles. The evaluation strategy should demonstrate constructive alignment between the course objectives and the assessment. The evaluation strategy should clearly outline the level of Kirkpatrick for the course assessments.

Courses must be delivered as self-paced online learning, packaged to the SCORM 1.2 standard and tested for deployment on the Academy learning platform.

Content shall be developed using tools that ensure the transfer of both the end products and the source files to EIT RawMaterials. Our preferred tools are the Articulate Suite (Storyline and Rise) and Synthesia, which allow us to maintain and update a central library of materials over time.

All content must meet WCAG 2.2 accessibility standards. During the development period, if there are amendments to the accessibility standards based on EU standards or regulations, these will need to be updated.

Content shall be created in British English.

2.2.3 Starter Packs

It is expected that the contractor will provide at least one starter pack.

The Starter Pack may either complement the course being developed or be designed as a standalone package of performance-support learning materials addressing a related topic of value to the industry. Starter Packs are practical, self-directed resources that help learners apply knowledge and skills within their own organisations. Examples may include implementation guides, checklists, blueprints, ready-to-use dashboards, compliance tracking templates, and reference materials. Starter Packs should place particular emphasis on supporting small and medium-sized enterprises (SMEs), as the Academies have identified these resources as an important mechanism for strengthening SME capacity and supporting organisational development.

2.2.4 Inclusive design and gender dimension

In line with EIT RawMaterials' Gender Equality Plan, the contractor must apply inclusive programme design and reflect the gender dimension in the educational content and should give due consideration to broader diversity in the materials workforce. This includes:

- Representation of diverse role models and practitioners, avoiding content skewed toward a single gender, in case studies, video content, Synthesia avatars/voices and supporting imagery;
- Review of language, scenarios and examples for gender bias, including in sample datasets used for practical exercises;
- Design choices — tone, framing, examples chosen — that make the content equally accessible and engaging to learners of all genders, career stages, cultural backgrounds and accessibility needs;
- Where relevant, reflection of the diversity of the European raw and advanced materials workforce, including different national, cultural and professional contexts across Member States.

2.2.5 Support for European industry

Courses developed under this contract shall support the development of European industry. Case studies, datasets, examples and regulatory references shall reflect European operations, value chains and legislation wherever possible, and content shall be framed around the challenges European companies face.

Content should recognise that requirements may vary according to sector, material, product, organisational role, company size, value-chain position and Member State. Member State-specific examples must be clearly labelled and must not be presented as requirements applying uniformly throughout the European Union.

Examples should be relevant to both SMEs and larger organisations and should reflect the practical challenges faced by European raw and advanced materials companies.

2.2.6 Quality assurance, certification and credentials

All courses must comply with the Quality Management System (QMS) of the EIT RawMaterials and Advanced Materials Academies, which is aligned with EU quality frameworks including EQAVET, EQF, ESCO, the EIT Label Handbook for non-degree education, the EU Accessibility Act, and GDPR. A summary of the applicable quality requirements is provided in Annex 1; full details will be shared at contract stage. During the contract period, if the QMS undergoes updates due to regulatory or legal reasons, the contractor shall support in the implementation of updates as a result of these changes. This could also extend to expert representation as the “primary trainer” in front of certification or regulatory bodies or allowing EIT RawMaterials to designate an alternative expert as the primary trainer for the sake of course certification or regulatory compliance reasons. The contractor commits to filling in any templates provided by EIT RawMaterials to create the QA documentation artifacts.

In practice, the contractor must declare an associated EQF level, apply the corresponding Academy classification (Basic, Intermediate, Advanced, Expert), support ESCO competency mapping and document alignment with EIT requirements with regards to overarching learning outcomes and value chain alignment (see Annex 1).

All content must be SCORM1.2 compliant, meet WCAG 2.2 and comply with GDPR. During the development period, if there are amendments to the accessibility standards based on EU standards or regulations, these will need to be updated.

Each course must include a summative assessment with a declared pass mark. Contributing trainers and subject matter experts must complete the relevant parts of the Academies' Training Contributor Certification Programme (TCCP). Courses must be designed to be certifiable by a recognised, industry-relevant authority (e.g., a professional society, industry body, or sector accreditation provider). The contractor shall cooperate with EIT RawMaterials in securing the accreditation route selected for the course.

Courses may be subject to approval by the German State Central Office for Distance Learning (ZFU) under the Fernunterrichtsschutzgesetz (FernUSG). The approval obligation rests with EIT RawMaterials as course operator. If ZFU applicability is determined, the provider shall supply all course documentation required for the approval process and implement any content or descriptive changes required by the ZFU at no additional cost, insofar as they result from non-conformity of the delivered materials.

Digital credentials will be issued through the Academies' certification platform. Certification issuance is conditional on successful completion of the declared assessment. Learner feedback will be collected systematically through the Academies' evaluation framework.

In case the certification is coming from the contractor, EIT RM would be designated as the issuing authority, and the final certificate would be co-branded to represent the academies as well as the issuing organisation through mutual agreements.

Certificates will be issued through EIT RM platforms.

Trainers and named content contributors will be required to complete the Academy's Training Contributor Certification Programme:

<https://learningpoint.eitrawmaterials.eu/Minisite/home/4667278>

<https://academy.eitrawmaterials.eu/Minisite/home/4667278>

2.2.7 Subject Matter Expert (SME) Validation and AI Safeguards

To ensure the industrial relevance, technical accuracy, and pedagogical integrity of the courses, the Academies enforces a strict "no AI-only content" policy. Content generated solely via generative AI utilities without expert validation will not be accepted. The contractor must provide structural assurance of expert oversight through the following measures:

Mandatory SME Alignment: All learning materials, scripts, datasets, and case studies must be co-developed and formally validated by a named, qualified industry or academic Subject Matter Expert (SME) with proven domain expertise in the specific materials or manufacturing application.

TCCP Certification: All contributing SMEs must complete the Academy's Training Contributor Certification Programme (TCCP) prior to content development.

Formal Sign-off Deliverables: The contractor must deliver a signed SME Validation Statement. This statement must certify that the technical content is accurate, representative of actual European industrial operations, and free of unverified AI-generated content.

The names and CVs of experts should be well documented and submitted to the Academies along with other quality-related artifacts. These CVs may be stored and processed by EIT RawMaterials as long as the module is online and may also be transmitted to certification bodies or regulatory compliance bodies.

2.2.8 Maintenance

At the twelve-month mark after course launch, EIT RawMaterials shall conduct a structured course review based on learner feedback data (post-course evaluations, assessment performance, and completion data collected by EIT RawMaterials), together with the annual content validity assessment. The review shall identify content that is outdated, unclear, or underperforming against learner feedback, and propose corresponding updates.

The contractor shall implement these updates under a pre-allocated maintenance budget.

During the subsequent years, EIT RawMaterials may review the material as well as learner feedback data with other relevant experts to define if the content needs to be updated or retired. If updates are managed within EIT RawMaterials, the contractor agrees to the content being modified after being online for at least 2 years by other experts or content managers without the contractor's involvement.

Maintenance work is triggered by EIT RawMaterials based on the review findings; the maintenance budget is payable only for updates commissioned and delivered.

The exception to this clause is if errors are found in the technical content during the first year of the course delivery. In such cases, EIT Raw Materials will expect the expert to update the course to remove inaccuracies at the earliest at no additional cost.

2.2.9 Deliverables

For each course, the contractor must deliver:

- Academy-branded SCORM packages tested and accepted on the Academy learning platform.
- complete and editable source files, including Articulate project files and Synthesia scripts and video assets.
- assessment items with answer keys and scoring guidance.
- confirmation of the certification arrangement described in the proposal.
- Starter Pack materials, where offered.
- a course description and metadata for the Academy catalogue.
- Quality artefacts including templates and checklists provided by EIT RawMaterials to ensure alignment of the courses with our Quality Management System (QMS). Details of these are provided in Annex 1

2.2.10 Intellectual property and AI transparency

All intellectual property rights in the deliverables, including courses, source files, scripts, video assets and assessment materials, will be assigned to EIT RawMaterials upon acceptance and payment. These rights include, without limitation, the right to host and distribute the content on any platform of EIT RawMaterials' choosing, to adapt and update it, to translate it into other languages, and to sublicense

it to Academy partners. The contractor also grants EIT RawMaterials the right to use content for promotional material, social media platforms and marketing channels.

Pre-existing materials of the contractor or of third parties must be identified beforehand and licensed to EIT RawMaterials on a perpetual, irrevocable, royalty-free basis covering the same uses. The contractor warrants that all third-party content is properly licensed for these purposes. These obligations apply equally to consortium members and subcontractors.

Where datasets are used in practical activities, providers must describe, for each dataset: (a) ownership and source; (b) licensing terms and any usage restrictions; (c) anonymisation or pseudonymisation measures applied, including GDPR compliance where personal data is involved; (d) rationale for the dataset's suitability for the intended educational objectives.

Where AI-generated media is used, including Synthesia video, output licences must permit EIT RawMaterials' continued use and editing of the material, documented consent must be obtained for any real person's likeness or voice, and the content must comply with the transparency obligations of the EU AI Act, including the labelling of synthetic media.

Full intellectual property terms will be set out in the contract.

2.2.11 Timeline

All courses must be delivered, tested and accepted within six months of contract signature.

3. Content of the proposal

Proposals should be concise and specific. Please structure your proposal around the following sections:

- (1) Understanding of the need.
- (2) Course/module concept.
- (3) Development approach and project plan.
- (4) Certification and evaluation.
- (5) Accessibility and inclusivity approach.
- (6) Quality and support.
- (7) Team.

For more detailed please refer to section 6.4 of the Invitation to Tender.

4. Pricing

All services and works under this contract shall be remunerated under a fixed budget of EUR 100,000 excl. VAT and should include the twelve-month maintenance provision described in Section 2.2.8, which may not exceed ten percent of the overall contract value.

For more detailed please refer to section 6.5 of the Invitation to Tender.