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D4.3 Learning Programmes Training Materials/Resources

31 July 2024

30 September 2023

30 September 2023

Co-funded by
the European Union

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How to cite

ARISA. (2024). D4.3 Learning Programmes Training Materials/Resources. [URL]

Project information

The Artificial Intelligence Skills Alliance (ARISA) fast-tracks the upskilling and reskilling of employees, job seekers, business leaders, and policymakers into AI-related professions to open Europe to new business opportunities. It is a four-year transnational project funded under the EU's Erasmus+ programme. For more information, contact info@aiskills.eu | aiskills.eu

Project Partners

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List of Piloting Partners

ADECCO	ADECCO FORMAZIONE SRL
UNIPISA	The University of Pisa
UNIR	UNIR – La Universidad en Internet- Universidad Internacional de La Rioja
BCS	BCS Koolitus
UL	University of Ljubljana
BME	BME University: Budapest University of Technology and Economics
WSCS	Warsaw School of Computer Science
HU	HU University of Applied Sciences Utrecht
GK	Global Knowledge

List of abbreviations and acronyms

AI	Artificial Intelligence
ARISA	Artificial Intelligence Skills Alliance
D	Deliverable
EC	European Commission
EQF	European Qualification Framework
ESCO	European Skills, Competences, and Occupations
EU	European Union
FAQ	Frequently Asked Question
LU	Learning Unit
PLO	Program Learning Outcome
T	Task

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1. Executive Summary

1.1. Introduction

The present report (D4.3) explains how the project moved from the core curricula (defined in D4.2), to the learning programmes training materials for these curricula.

It illustrates how a qualitative collaborative approach, supported by tailored tools and frequent partner engagement, facilitated the development and aggregation of learning programmes training resources for curricula and Learning Units (LUs). The report delineates the methodologies employed, including the creation of guidelines, templates, and collaborative frameworks that ensured coherence and efficiency in material development.

The training programmes created incorporate theoretical foundations, practical examples, and interactive components, aiming to meet the diverse educational needs while aligning with European AI Skills Strategy and EQF standards.

1.2. Objectives

This deliverable (D4.3) aims to design and develop training programmes to implement the curricula produced in deliverable D4.2. Each programme has a modular structure that allows for flexibility in content, learning pace and duration, to be tailored to specific needs inside the target group.

For each module, appropriate learning methodologies and tools were identified and developed. This includes creating essential resources such as slides and project works.

The final outputs are a refined set of training programmes and materials and resources prepared for deployment across Europe during following stages of the ARISA Project.

This approach ensures that our training programmes not only impart theoretical knowledge but also facilitate practical application and interactive learning experiences, supporting the educational objectives of the ARISA project across diverse European contexts.

1.3. Methodological approach

To achieve the results of this report, we adopted a collaborative approach, supported by the development of tools tailored for this process. Partners collaborated by integrating their knowledge and contributions through the organization and management of recurring meetings, as well as through sharing documents with each other for feedback.

The methodology for gathering training materials involves a two-step process. The first step, "Development of Guidelines and Templates," focuses on creating tools to assist in the development and collection of these materials. Key tools produced include a “FAQ document” to address common questions and clarify procedures, a “Requests & Offers Tool” to streamline the exchange of resources among partners, and a “Training Materials Collection Table Template” for organizing and documenting training materials with details such as the links to the internal Teams Channel, where the materials were saved, and the type of delivery method of the materials (e.g. lectures, team projects…). The second step, "Gathering of Training Materials," entails partners using these tools and templates to create training materials for the LUs they will pilot.

Continuous support from the task leader, along with mutual peer reviews, ensured the quality and consistency of the materials. This iterative approach helped maintain coherence, accessibility, and alignment with the project's goals, allowing for revisions and improvements throughout the project's lifecycle.

1.4. Results

The results of this task are comprehensive and structured training programmes and materials tailored for the AI profiles on which the project focuses. These materials are characterized by detailed instructions, theoretical content, practical examples, and interactive components such as case studies and workshops, ensuring consistency and high quality.

Significant results include the creation of training materials that cover essential domains such as data analysis, machine learning, AI strategy development, and legal considerations. These materials are specifically designed to cater to the needs of Data Analysts, Data Scientists, Machine Learning Engineers, Decision Makers, Policy Makers, and AI Advisors.

For AI Managers, the materials' main focus was found to be on foundational AI knowledge, strategic decision-making, ethical considerations, and policy awareness. For AI Professionals instead, the training materials core areas are advanced AI technologies, machine learning, soft skills, future innovations, explainable AI, and cybersecurity.

The training programmes incorporate lectures, case studies, practical activities, discussions, and videos to enhance learning experiences. Additionally, AI Professionals are engaged in projects to promote practical application and innovation, ensuring that the training is impactful and directly applicable to real-world scenarios.

1.5. Conclusions

This deliverable, D4.3 "Learning Programmes Training Materials/Resources", outlines the transition from curricula to training programmes and materials for AI-related educational profiles within the ARISA project. By employing a collaborative, structured approach with tailored tools and regular feedback, the project developed materials that cover theoretical content, practical examples, and interactive components. These materials cater to ARISA AI roles ensuring both foundational knowledge and hands-on experience. The deliverable supports the European AI Skills Strategy, facilitating the skilling, reskilling, and upskilling of the workforce across different educational contexts.

1.6. Use of this document

The main use of this document is to provide insights for the further progress of the development of training programmes. It can further be used by government, industry, and education and training representatives to get insights into the key factors and enablers of effective skilling and reskilling programmes, and to understand how to promote and build trust in AI. It also offers valuable insights into how to become or keep up to date with AI developments.

2. Introduction

This document (D4.3) presents the development of the training programmes and materials essential for the ARISA core curricula presented in D4.2.

The objective of this deliverable (D4.3) is to design and develop training programmes to implement the core curricula produced in deliverable D4.2. The training materials, which are a component of the training programmes, have been gathered specifically for the curricula and Learning Units (LUs) that will be piloted by the project partners. Each programme has a modular structure that allows for flexibility in content, learning pace and duration, to be tailored to specific needs inside the target group.

The methodological approach adopted for this report is collaborative, supported by the development of tailored tools for the process. Emphasizing collaboration, partners' knowledge and contributions were integrated through regular meetings and document sharing for feedback. The methodology is structured into two steps. The first step involved creating tools, templates, and guidelines to support the task, while the second focused on the partners' production of training materials for the identified curricula and LUs and their subsequent collection.

The training materials, developed for the AI profiles on which the project focuses, ensure consistency and quality by following a standardized format. This includes detailed instructions, theoretical content, practical examples, and interactive components such as case studies and workshops. The materials are designed to cater to the learning needs of Data Analysts, Data Scientists, Machine Learning Engineers, Decision Makers, Policy Makers, and AI Advisors.

The following part of the document Is structured in two sections: the methodology, described in Section 3, outlines the processes and tools designed to aid partners in producing and gathering these materials and the results, presented in Section 4, provide a detailed overview of the training materials collected.

3. Methodology

The gathering of the training materials is articulated in two steps. In this section both steps are presented: the first, "Development of guidelines and templates", describes the tools, templates and guidelines implemented to support the task. The second, "Gathering of the Training Materials", shows the method implemented to develop and collect the training materials for each LU defined in the Core Curricula (D4.2) that partners will pilot.

3.1. Development of guidelines and templates

The aim of this step was to create the tools for partners to develop and gather the training materials needed for the LUs that they will pilot. Doing this was important to ensure the coherence of the output and the efficient implementation of T4.3 Creation of learning programmes and materials.

The main tools produced are the following:

1. Frequently Asked Questions (FAQs) document (Section 3.1.1.)
2. Requests & Offers tool (Section 3.1.2)
3. Training Materials Collection Table Template (Section 3.1.3.)

The tools were shared and validated by the consortium during multiple meetings.

The training materials have been developed exclusively for those LUs that will be piloted. These materials have been produced in English to ensure accessibility across Europe for all partners and the education ecosystem. The training materials can take various forms, including presentations and word documents.

All training materials must adhere to an open license under the Creative Commons BY-NC (Attribution-Non-commercial) license. While direct incorporation of copyrighted content into the initial submissions is prohibited, partners can include references such as links to copyrighted videos and other sources. Fair use of copyrighted materials is limited to enclosed environments, such as classrooms. Therefore, initial submissions should exclude copyrighted content directly but can be modified in later stages of the ARISA project for classroom presentations.

3.1.1. Frequently Asked Questions (FAQs) document

The FAQs document serves as a comprehensive resource designed to address common questions related to T4.3 Learning Programmes Training Materials/Resources. The aim of this document is to ensure that all partners have a clear understanding of the procedures, requirements, and expectations for creating and piloting training programmes and materials. This resource is pivotal for maintaining coherence in outputs and facilitating the smooth execution of T4.3.

The document is structured into several sections, each addressing specific queries and providing detailed answers. The content of the document includes practical guidelines, procedural details, and references to additional resources for better understanding. It ensures that partners are well-informed and equipped to produce high-quality, standardized training programmes and materials that adhere to the project's goals and requirements.

3.1.2. Requests & Offers tool

The "Requests & Offers" tool, shown in Annex 1, is an Excel document designed to facilitate the exchange of training materials among partners. Its main goal is to streamline the process of requesting and offering various educational resources, ensuring that all partners can access and share materials efficiently. This promotes collaboration and resource sharing, which are crucial for the successful development of the training materials.

Partners used this tool to either request specific training materials or offer the materials they already produced. By filling in the relevant sections, they could communicate their needs and contributions, helping to build a comprehensive library of resources that aligns with the project's educational goals.

The tool includes both instructional text and forms for data entry. The instructional sheets ensure that users understand how to properly fill out the forms, while the request and offer sheets are designed for easy input and sharing of information.

3.1.3. Training Materials Collection Table Template

The "Training Materials Collection Table Template", shown in Annex 2, is an Excel file designed to collect and organize training materials related to the ARISA project.

It consists of two main sections: an "Instructions" sheet providing detailed guidelines for filling out the table with notes and legends to ensure data consistency, and a "Collection Table" sheet where specific details about training materials are recorded. These details include organization names, curriculum titles, related learning units, learning outcomes, EQF levels, links to ARISA training materials, delivery methods, and additional notes. This information is fundamental to the organization of the training programmes and materials, helping to gain an overview of the task progress and comprehending the types and attributes of the materials produced.

The aim of the document is to facilitate the collection and standardization of the training materials, ensuring they are well-documented, easily accessible, and consistently categorized, as well as the production of complete training programmes.

3.2. Gathering of the Training Materials

The goal of this second step is to gather the training materials for each LU that partners will pilot.

During this step, the tools shown in Section 3.1 were shared together with templates to use for the training materials creation or adaptation. The templates shared for slides and documents are used to ensure a consistent and professional layout for all training materials. In addition, a series of folders was created to enable partners to upload and share the materials.

The activities for this step are:

1. Adaptation or creation of the needed training materials using the Templates.
2. If needed, request or offer of materials through the Requests & Offers tool (Section 3.1.2).
3. Uploading of the training materials in the corresponding folder.

4. Completion of the Training Materials Collection Table (Section 3.1.3) with the links of the materials uploaded in the folders.

The task leader assisted the partners through continuous interactions and meetings. The meetings were held weekly, to address any challenges the partners encountered in completing the task. These interactions provided a platform for partners to voice concerns and discuss solutions promptly, ensuring smooth progress and collaboration.

To further enhance the quality and accuracy of the training materials, partners were paired with each other for mutual review. Each partner checked the other's materials for typos, adherence to the template, and completeness and correctness of content.

Information from D4.2 Core Curricula where also gathered to contribute to the creation of the complete forms of the training programmes.

Only the partners involved in piloting will develop the training materials. Throughout the following work packages of the project, partners will have the opportunity to review and revise the materials to ensure they meet the required standards and needs. This iterative process ensures that the final materials are both comprehensive and tailored to the project's goals and the learners' needs.

4. Results

The training programmes (shown in Annex 3) and materials developed for the ARISA project are structured to ensure clarity and ease of use for learners across different AI-related educational profiles. These materials follow a standardized format, typically including detailed instructions, theoretical content, practical examples, and interactive components such as case studies and workshops. This structured approach helps maintain consistency and quality across all educational resources.

Partners contributed with training materials for a total of 36 LUs across various AI educational profiles and EQF levels. These entries span multiple domains, including data analysis, machine learning, AI strategy development, and legal considerations in AI.

As shown in Table 1, the LUs that partners will pilot, and for which training materials were prepared, include profiles for Machine Learning Engineers at EQF 7 (7) and EQF 6 (1), Data Analysts (4), Data Scientists (4), Decision Makers (10), Decision Makers and Policy Makers (1), Policy Makers and AI Advisors (5) and AI Advisors (4). For the Data Analysts and the Decision Makers profiles two curricula will be piloted, therefore the LUs counted are distributed in two curricula each.

AI Role Group	AI Profile	# LUs Piloted	Link to the training materials
AI Practitioners	Machine Learning Engineer (EQF 7)	7	Training Materials
	Machine Learning Engineers (EQF 6)	1	Training Materials
	Data Analysts (EQF 6)	4	Curriculum A Curriculum B
	Data Scientists (EQF 6)	4	Training Materials
AI Managers	Decision Makers (EQF 6/7)	10	Curriculum A Curriculum B
	Decision Makers and Policy Makers (EQF 6)	1	Training Materials
	Policy Makers and AI Advisors (EQF 6/7)	5	Training Materials
	AI Advisors (EQF 6/7)	4	Training Materials
Total		**36**	

Table 1: Overview of the training materials produced

Figure 1 shows the PLOs covered by the training materials produced for AI Professionals. The largest portion, at 16%, is dedicated to "AI Technologies," ensuring that professionals gain a broad understanding of various AI tools and methods. Following this, 14% is focused on "Machine Learning," emphasizing its critical role in AI development. "Soft Skills" make up 11%, highlighting the importance of communication and teamwork. Both "Deep Learning" and "AI Futures and Innovation" cover 9% each, showcasing the need for advanced AI knowledge and forward-thinking approaches. "Explainable AI" constitutes 7%, underlining the necessity for transparency in AI systems.

Other significant areas include "Big Data & Data Analytics" and "AI Ethics," each at 5%, ensuring professionals are well-versed in data management and ethical considerations. "AI Awareness," "Cyber and Data Security," and "Business Intelligence" each represent 3%, while "Generative AI" is 2%, covering specialized AI topics. This demonstrates a comprehensive training approach, balancing technical expertise with ethical and strategic knowledge for AI professionals.

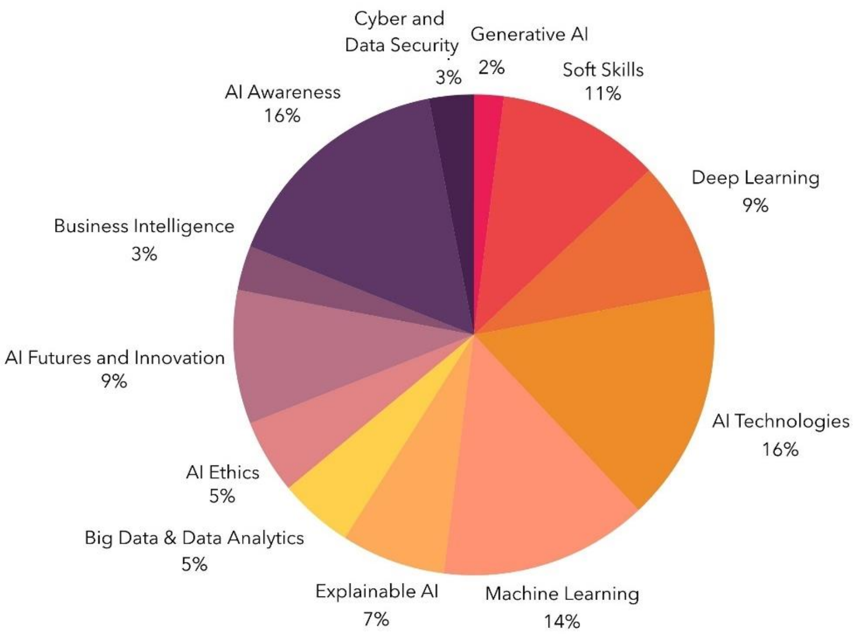

Figure 1: PLOs covered by the LUs piloted for AI Professionals

Figure 2 shows the PLOs covered by the piloted LUs and thus by the training materials for AI Managers. The largest slice, at 37%, is dedicated to "AI fundamentals," ensuring that participants gain a strong foundational understanding of AI. "Organisational decision-making on AI" follows with 17%, emphasizing the importance of strategic decision-making in AI initiatives. The "Impact of AI" accounts for 14%, reflecting the need to comprehend AI's broader effects. "AI Ethics advanced" covers 11%, highlighting the importance of ethical considerations. Additionally, "AI implementation" and "AI Strategy" each take up 9%, focusing on the practical application and strategic planning of AI technologies. Lastly, "AI and policy" makes up 3%, pointing to the relevance of understanding AI-related policies. This chart showcases a comprehensive and balanced approach to training AI Managers in the essential aspects of AI.

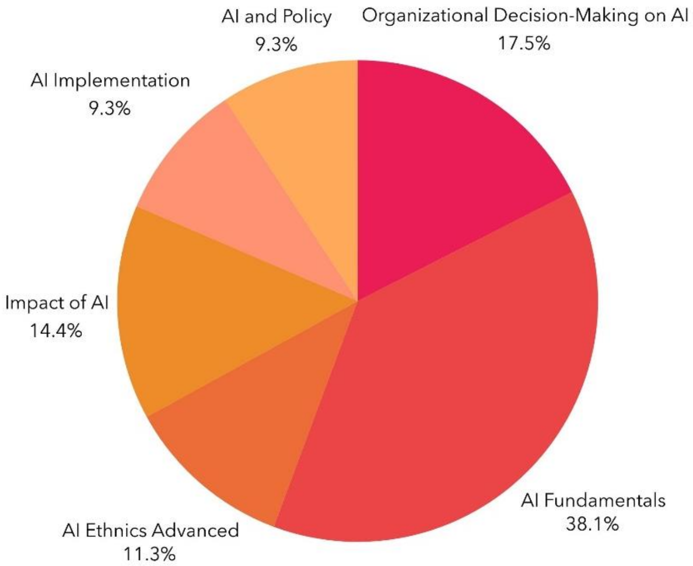

Figure 2: PLOs covered by the LUs piloted for AI Managers

Most of the training materials for AI Managers and AI Professionals will be delivered through lectures, supplemented by various other methods to enhance learning. For AI Managers, the training places a strong emphasis on case studies and practical activities, ensuring that participants gain both theoretical knowledge and hands-on experience. Discussions are also a key component, facilitating interactive learning and deeper understanding. Videos are used to provide visual and auditory learning aids.

In contrast, the training for AI Professionals incorporates a more diverse range of delivery methods. While case studies and practical activities are also prominent, there is an additional focus on projects, promoting practical application and innovation. Discussions and videos are included to support varied learning styles and preferences.

Overall, the approach for AI Managers is more discussion-oriented, with discussions led by skilled and experienced lecturer, aiming to foster analytical thinking and problem-solving skills through interactive methods. For AI Professionals, the training is more diversified, with an emphasis on practical projects to encourage real-world application and innovation in the field of AI.

5. Conclusions

This deliverable, D4.3 "Learning Programmes Training Materials/Resources", encapsulates the efforts and methodologies employed to transition from the curricula defined in D4.2 to the development of complete training programmes and materials. These training programmes and materials are designed to underpin the piloting phases of the ARISA project, ensuring that training is relevant, comprehensive, and aligned with industry needs and educational standards.

The structured approach to developing and gathering training materials involved close collaboration among project partners. This process was facilitated by the creation of tailored tools such as guidelines, templates, and the Requests & Offers tool, which promoted consistency and quality across all outputs.

The training programmes encompass a variety of AI-related educational profiles, including Data Analysts, Data Scientists, Machine Learning Engineers, AI Managers, and Policy Makers. Each set of materials includes theoretical content, practical examples, and interactive components like case studies and workshops. This ensures that learners gain both foundational knowledge and hands-on experience, preparing them for the practical demands of AI professions.

For AI Managers, the training focuses on foundational AI knowledge, strategic decision-making, ethical considerations, and policy awareness, supplemented by discussions and case studies to foster analytical thinking and problem-solving skills. For AI Professionals, the emphasis is on technical expertise in AI technologies, machine learning, and future innovations, with a strong component of projects to promote practical application and innovation.

In summary, this deliverable offers an up-to-date set of training programmes, materials and resources designed to facilitate the programme's implementation across Europe within the ARISA project. It serves as a practical guide for educators, policymakers, and industry stakeholders, ensuring that AI training is both effective and adaptable to evolving educational and professional landscapes.

Annex 1: Requests & Offers tool

The document is structured into several key sheets:

1. **Requests Instructions**: Provides detailed instructions and guidelines for partners on how to fill out the request form. It includes notes and a legend to clarify the process.
2. **Requests**: A form where partners can specify their requests for training materials. Columns include:
   - Organisation: the name of the requesting organization.
   - Curriculum Name: the name of the curriculum for which the training material is needed (e.g. NLP Engineer).
   - EQF level: The EQF level associated with the curriculum (e.g. EQF 5).
   - Program Learning Outcome (PLO) of the Learning Unit: the specific learning outcomes (LOs) of the LU for which the materials are required (e.g. AI fundamentals).
   - Type of Supporting Material needed: the kind of material requested (e.g. PPT file about Text Mining).
   - Notes: additional information or specific details regarding the request.
3. **Offers Instructions**: Similar to the Requests Instructions sheet, this provides guidelines for partners on how to fill out the offer form.
4. **Offers:** A form where partners can list the training materials, they have available to share. Columns include:
   - Organisation: the name of the offering organization.
   - Curriculum Name: the name of the curriculum for which the training material is available (e.g. NLP Engineer).
   - EQF level: the EQF level associated with the curriculum (e.g. EQF 5).
   - PLO of the Learning Unit: the specific learning outcomes covered by the offered material (e.g. AI fundamentals).
   - Link to Supporting Material: a hyperlink to the available supporting material uploaded in the dedicated folder.
   - File Format: the format of the offered material (e.g. PDF, Text, Video).

- Language: the language in which the material is available (e.g. English).
- Property License: the type of license under which the material is shared (e.g. Creative Commons, Copyright, Restricted access).
- Notes: additional information or specific details regarding the offer.

Requests Instructions

Please follow the indications ('Legend') and notes below to fill out the Requests Table

Note 1: *The column "F - Notes" is dedicated to collect additional information not included in the template.*

Legend	
A - ORGANISATION	Please fill this column with the name of your organisation.
B - CURRICULUM NAME	Please enter the name of the curriculum for which you are requesting training materials in this column.
C - EQF	Please enter the EQF level of the curriculum for which you are requesting training materials in this column.
D - PLO	Please enter the PLO (Programme Learning Outcomes) of the curriculum for which you are requesting training materials in this column.
E - TYPE OF SUPPORTING MATERIAL	Please provide the characteristics the training materials you are requesting should have (e.g. PPT file about Text Mining).
F - NOTES	Please use this space to provide additional information that is not foreseen in the Template. In order to help us to use this information in the most efficient way, please indicate the column and the row to which your additional information refers.

Requests

ORGANISATION	**CURRICULUM NAME** (e.g.: NLP Engineer)	**EQF** (e.g.: EQF 5)	**PLO of the LEARNING UNIT** (e.g.: AI fundamentals)	**TYPE OF SUPPORTING MATERIAL** (e.g. PPT file about Text Mining)	**NOTES**

Offers Instructions

Please follow the indications ('Legend') and notes below to fill out the Offers Table

Note 1: *The column "I - Notes" is dedicated to collect additional information not included in the template.*

Legend	
A - ORGANISATION	Please fill this column with the name of your organisation.
B - CURRICULUM NAME	Please enter the name of the curriculum for which the training materials you are offering are intended in this column.
C - EQF	Please enter the EQF level of the curriculum for which the training materials you are offering are intended in this column.
D - PLO	Please enter the PLO (Programme Learning Outcomes) of the curriculum for which the training materials you are offering are intended in this column.
E - LINK to SUPPORTING MATERIAL	Please provide the link to the file of the training material you are offering as uploaded on the "Offers" Teams Folder.
F - FILE FORMAT	Please indicate the file format of the training material you are offering.
G - LANGUAGE	Please indicate the Language of the training material you are offering.
H - PROPERTY LICENSE	Please indicate the Property License of the training material you are offering. In the drop-down menu four options are indicated: *creative commons, copyright, restricted access, other*. For each training material you are offering, please select one of the options provided, referring to the descriptions following: **Creative Commons,** refers to *Open Educational Resources (OER*), including learning, teaching and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, re-use, re-purpose, adaptation and redistribution by others. A core element of OER is their openness which is expressed through the use of a licence that explicitly permits free use and reuse by those other than the rights holder.

	Copyright, refers to *IPR (Intellectual Property Rights) covered material,* implying that the specific contents are covered by copyright and accessible only to those in possession of licenses or those who bought the property of the item. Whenever material is labelled as such, students and trainers must be aware that the content can be subject to fees and is not to be considered openly accessible. **Restricted access** material, indicates that contents, even if not covered by specific copyright, can be accessible only by an authorized target and/or part of an organization/institutions (i.e., training material made exclusively available to a company; resources disseminated for the sole use of the students of a higher institution). **Other**, refers to alternative sources of training with open access will be indicated for those materials labelled with IPR covered material and/or restricted access material to promote the sustainability of the project and its components.
I - NOTES	Please use this space to provide additional information that is not foreseen in the Template. In order to help us to use this information in the most efficient way, please indicate the column and the row to which your additional information refers.

Offers

ORGANISATION	**CURRICULUM NAME** (i.e.: NLP Engineer)	**EQF** (i.e.: EQF 5)	**PLO** (e.g.: AI fundamentals)	**LINK to SUPPORTING MATERIAL**	**FILE FORMAT** (e.g.: PDF, Text, Video)	**LANGUAGE** (e.g.: English)	**PROPERTY LICENSE** (i.e: creative commons / copyright /restricted access)	**NOTES**

Annex 2: Training Materials Collection Table Template

ORGANISATION	**CURRICULUM NAME** (e.g.: NLP Engineer)	**RELATED LEARNING UNIT** (e.g.: Introduction to the current AI innovations and their applications)	**PLOs of the LEARNING UNIT** (e.g.: AI fundamentals)	**EQF** (e.g.: EQF 5)	**ARISA LEARNING MATERIAL (link to the specific material)**	**DELIVERY METHOD OF THE MATERIAL** (e.g., lecture, case study, individual/team-project, role playing, internship).	**NOTES**

Annex 3: Training Programmes

MACHINE LEARNING ENGINEER EQF 7

1. General information

Name	Machine Learning Engineer
EQF level	EQF 7
Goals	The intent of the EQF 7 Machine Learning (ML) Engineer curriculum is to provide a solid base in ML techniques, develop advanced machine learning and artificial intelligence (AI) skills, and ensure the ability to build and manage ethical and secure AI systems. Its aim is to produce graduates who are ready to lead and innovate as ML Engineers, capable of tackling complex problems and contributing to advancements in technology and society, as well as being capable of applying their knowledge to real-world problems.
Scope	The curriculum is aimed at people who intend to become ML Engineer practitioners. It can also be used to upskill or reskill individuals that already have a background in computer science and want to specialize in ML. It is also intended to both articulate how to instantiate for both microcredentials as well as conventional second-cycle courses, as both options are valid for aspiring ML Engineers (for example if they possess a master's degree already). It is also agnostic as regards platforms and APIs so to allow customisation to local requirements.
Piloted Programme learning outcomes (PLOs)	1 - Deep Learning (EQF 7) 2 - AI Technologies (EQF 7) 3 - ML Ops (EQF 7) 4 - Machine Learning (EQF 7) 5 - Explainable AI (EQF 7) 6 - Big Data & Data Analytics (EQF 7) 7 - Human-Centered AI (EQF 7) 8 - AI Ethics (EQF 6) 9 - AI Awareness (EQF 6) 10 - Cyber and Data Security (EQF 5) 11 - Generative AI (EQF 7) 12 - Change Management (EQF 6) 13 - Soft Skills (EQF 6) 14 - HPC and Cloud services (EQF 7)

References	D4.2 Core Curricula (Annex 4 Core Curricula and Specific Curricula)
Link to the training materials	Training Materials

2. Overview of Piloted Learning Units

Learning unit title	Learning Unit Description	Hours /ECTS	Assessment(s)	Delivery Method(s) of the training materials
Machine Learning Foundations	The "Machine Learning foundations " learning unit is designed to provide students with a comprehensive understanding of both foundational and advanced machine learning techniques. Students will learn the fundamentals and practical use of predictive models for various classification, regression, and unsupervised learning tasks. The curriculum covers a wide range of topics, from classical algorithms to reinforcement learning methods.	2-10 ECTS	Exam and/or Practical Assignment, Project work	Lecture
Deep Learning	The "Deep Learning" learning unit is focused on advancing students to deep learning models, methods and applications. The learning unit also introduces the necessary hardware architecture and software tools, as well as model development and deployment methods, with practical examples.	2-10 ECTS	Exam and/or Practical Assignment, Project work	Lecture
Data Science	The "Data Science" learning unit is designed to introduce students to the fundamental concepts, techniques, and tools used in data science. This unit covers the process of extracting insights and knowledge from structured and unstructured data, with a focus on statistical analysis, data visualization, and data-driven decision-making.	2-10 ECTS	Exam and/or Practical Assignment, Project work	Lecture

AI Applications (NLP, coding tools, CV, Speech, cybersecurity, etc.)	This learning unit has been articulated to allow customisable delivery in specific AI application areas and upskill to current state-of-the-art. The broad aim of the learning unit is to showcase engender a deep appreciation of how AI is transforming products and services. The narrower aim of the learning unit is to introduce immerse students to in the latest AI solutions, mainly based on advanced deep learning models, and to give them practice in developing project-based AI solutions.	1-5 ECTS	Exam and/or Practical Assignment, Project work	Lecture
AI Law and Ethics	ML Engineers need to be aware of their legal and professional responsibilities and this unit aims to deliver this in a manner accessible to technologists.	1-25 ECTS	Exercises based on the analysis of case studies and/or realistic scenarios (can be under exam conditions if required, also scope for groupwork)	Lecture
Project and Thesis Work	Aspiring ML Engineers benefit from an opportunity to exercise their acquired knowledge and skills in an extended piece of work. To this end, a synoptic capstone Project and Thesis Work learning unit may be offered. This unit supports both a traditional academic project typical of second-cycle studies, as well as a work-based or industrial project. It could also be used as a concluding unit in a microcredential-based scheme that leads to a larger award. The scheme should give clear guidance as to what constitutes a suitable project in the context of the final award as well as providing support in appropriate methodological issues (eg. referencing). The focus and the regulations of the awarding institutions and overall purpose of the study programme will determine the	5+ ECTS	Project report, presentation/ demonstration.	Lecture and Report Template

	type and shape of the project. That said, a minimum of 5 ECTS is suggested to allow for an extended piece of work to be produced.			

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MACHINE LEARNING ENGINEER EQF 6

1. General information

Name	Machine Learning Engineer
EQF level	EQF 6
Goals	The intent of the EQF 6 Machine Learning (ML) Engineer curriculum is to provide a solid base in ML techniques, develop machine learning and AI skills, and ensure the ability to join teams that build and manage ethical and secure AI systems. Its aim is to produce graduate professional who are ready to enter the job market as entry-level ML Engineers, capable of assisting in tackling complex problems and contributing to advancements in technology and society, as well as being capable of applying their knowledge to real-world problems.
Scope	The curriculum is aimed at people who intend to become entry-level ML Engineers. It can also be used to upskill or reskill individuals that already have a background in computer science and want to specialize in ML. It is also intended to both articulate how to instantiate this curriculum for both microcredentials/short courses as well as a specialisation for conventional first-cycle degree courses, as both options are valid for aspiring ML Engineers (for example if they possess a related degree already) It is also agnostic as regards platforms and APIs so to allow customisation to local requirements
Piloted Programme learning outcomes (PLOs)	1 - Deep Learning (EQF 6) 2 - AI Technologies (EQF 6) 3 - ML Ops (EQF 6) 4 - Machine Learning (EQF 6) 5 - Explainable AI (EQF 6) 7 - AI Awareness (EQF 6) 8 - Cyber and Data Security (EQF 5) 9 - Generative AI (EQF 6) 11 - Soft Skills (EQF 6)
References	D4.2 Core Curricula (Annex 4 Core Curricula and Specific Curricula)
Link to the training materials	Training Materials

2. Overview of Piloted Learning Units

Learning unit title	Learning Unit Description	Hours /ECTS	Assessment(s)	Delivery Method(s) of the training materials
Deep Learning	The "Deep Learning" learning unit is focused on introducing students to the fundamentals of neural networks, a cornerstone of modern artificial intelligence, the deep learning paradigm and related methods. This unit covers the architecture, functioning, and practical applications of different types of neural networks.	2-8 ECTS	Exam and/or Practical Assignment, Project work	Lecture

DATA ANALYST – CURRICULUM A

1. General information

Name	Data Analyst
EQF level	EQF 6
Goals	The purpose of the Data Analyst EQF 6 curriculum is to provide participants with basic knowledge on how to find, use, analyze and use data in assessing, measuring and arguing a business decision with the introduction of relevant methodologies. In addition, participants will gain practical basic skills in managing the life cycle of data, i.e. valorizing data. To do this, participants perform practical tasks for data processing and analysis with the appropriate software.
Scope	This retraining course is designed for individuals looking to change their career and become data analysts, as well as for professionals who want to supplement their data analytics skills in their current profession.
Piloted Programme learning outcomes (PLOs)	6 - Big Data & Data Analytics (EQF 6) 8 - AI Ethics (EQF 6) 10 - Business Intelligence (EQF 6) 12 - Cyber and Data Security (EQF 6)
References	D4.2 Core Curricula (Annex 4 Core Curricula and Specific Curricula)
Link to the training materials	Training Materials

2. Overview of Piloted Learning Units

Learning unit title	Learning Unit Description	Hours /ECTS	Assessment(s)	Delivery Method(s) of the training materials
Data visualization using Power BI	This unit provides a comprehensive introduction to a BI tool designed to facilitate informed decision-making. Participants will gain hands-on experience in importing data from various sources using Power Query and organizing this data into effective data models. The course covers techniques for cleaning, transforming, and combining data to create a cohesive data model. Additionally, participants will learn to visualize data using Power BI Desktop, enabling them to create insightful and interactive reports and dashboards. By the end of the training, attendees will be equipped with the skills to collect, manage, and present data in a way that supports strategic decision-making.	24	Practical Exercises	On-site lectures with practical demonstrations of methods, tools, cases and practical exercises
Basics of Cyber Security	This cybersecurity module covers fundamental principles of cybersecurity, provides an overview of internet threats, and explores various types of viruses and cyber-attacks. Participants will learn strategies for threat prevention, the importance of strong passwords and backups, and where to seek help in case of security incidents.	4	Practical Exercises	On-site lectures with practical demonstrations of methods, tools, cases and practical exercises
GDPR	This module covers the essentials of GDPR, including key principles, compliance requirements, and best practices for data management. Participants will also learn about individuals' rights under GDPR and its impact on businesses in the EU.	4	Practical Exercises	On-site lectures with practical demonstrations of methods, tools, cases and practical exercises

DATA ANALYST – CURRICULUM B

1. General information

Name	Data Analyst
EQF level	EQF 6 for all units with exception on neural networks units where EQF level is 7 and 8
Goals	1. **Master Machine Learning Techniques:** Equip learners with essential skills in supervised and unsupervised learning, including clustering, classification, and regression. 2. **Develop Data Analysis Skills:** Enable proficient exploratory data analysis, visualization, and implementation of data analytic workflows. 3. **Design and Build Advanced Neural Networks:** Foster comprehensive knowledge in constructing, optimizing, and implementing neural networks and deep learning models from scratch. 4. **Apply Practical Machine Learning Tools:** Train learners to effectively use machine learning tools, recognize opportunities for their application, and implement solutions in various real-world scenarios. 5. **Ensure Ethical AI Deployment:** Instill understanding of ethical considerations, explainability, and best practices for responsible AI implementation.
Scope	**Scope of the Curriculum:** The curriculum provides a comprehensive and practical education in machine learning, data science, and AI, covering a broad range of topics from foundational concepts to advanced techniques. It encompasses unsupervised and supervised learning methods, neural network construction, text and image analytics, and ethical AI deployment. The training is designed to be accessible, requiring no prior knowledge of math or statistics for most learning units, and leverages advanced training techniques and modern visual analytics software to facilitate rapid and effective learning. **Target Groups:** The curriculum is tailored for employees in the industry and public sector who aim to delve deeply into machine learning, data science, and AI. It is ideal for professionals seeking to enhance their skills and apply cutting-edge technologies in their work. The pedagogical approach ensures that learners can quickly grasp complex concepts using advanced training techniques and state-of-the-art visual analytics tools, enabling them to achieve competency efficiently and effectively.
Piloted Programme learning outcomes (PLOs)	2 - PLO AI Technologies (EQF 6) 3 - ML Ops (EQF 6) 4 - Machine Learning (EQF 6) 5 - Explainable AI (EQF 6) 6 - Big Data & Data Analytics (EQF 6) 7 - Human-Centered AI (EQF 6) 8 - AI Ethics (EQF 6) 9 - AI Futures and Innovation (EQF 6) 10 - Business Intelligence (EQF 6) 11 - AI Awareness (EQF 6)

	14 - Soft Skills (EQF 6)
References	D4.2 Core Curricula (Annex 4 Core Curricula and Specific Curricula)
Link to the training materials	Training Materials

2. Overview of Piloted Learning Units

Learning unit title	Learning Unit Description	Hours /ECTS	Assessment(s)	Delivery Method(s) of the training materials
Unsupervised Learning	This unit delves into unsupervised learning techniques, starting with data representation and exploratory data analysis. It covers statistical fundamentals such as distributions and correlations, complemented by extensive data visualization methods. The curriculum includes an introduction to data analysis workflows and visual programming, with a focus on various clustering methods such as hierarchical, k-means, DBSCAN, and Gaussian mixture modelling using the expectation maximization algorithm. Dimensionality reduction techniques such as principal component analysis, multidimensional scaling, and t-SNE are explained. The unit also explores distance measurement, silhouette scoring for cluster validation, and techniques for explaining point-based visualizations.	50 / 2	Quizzes, Project Report	On-site lectures with practical demonstrations of methods, tools, and cases, Self-study assisted with pre-recorded video material and interactive lecture notes with quizzes and challenges, Project-based study with structured delivery of findings, On-line discussion of project results and quizzes, On-line forum, discussions and assistance on Discord channel

DATA SCIENTIST

1. General information

Name	Data Scientist
EQF level	EQF 6
Goals	The goal of the Data Science program is to provide a solid foundation in core data science techniques, develop advanced machine learning and AI skills, and ensure the ability to build and manage ethical and secure AI systems. These goals aim to produce graduates who are ready to lead and innovate in the data science field, capable of tackling complex problems and contributing to advancements in technology and society. The program is designed to ensure that graduates are proficient in both theoretical and practical aspects of data science and capable of applying their knowledge to real-world problems.
Scope	The course is aimed at people who intend to become Data Scientist/EQF 6. It can also be used for upskilling or reskilling of individuals that already have a background in computer science and want to specialize in Data Science.
Piloted Programme learning outcomes (PLOs)	1 - Deep Learning (EQF 6) 2 - AI Technologies (EQF 6) 3 - Machine Learning (EQF 6) 4 - Explainable AI (EQF 6) 6 - Big Data & Data Analytics (EQF 6) 7 - Human-Centered AI (EQF 6) 8 - AI Ethics (EQF 6) 9 - Business Intelligence (EQF 6) 10 - AI Awareness (EQF 6) 11 - Cyber and Data Security (EQF 6) 12 - Generative AI (EQF 6) 13 - Change Management (EQF 6) 14 - Soft Skills (EQF 6)
References	D4.2 Core Curricula (Annex 4 Core Curricula and Specific Curricula)
Link to the training materials	Training Materials

2. Overview of Piloted Learning Units

Learning unit title	Learning Unit Description	Hours /ECTS	Assessment(s)	Delivery Method(s) of

				the training materials
Machine Learning: Supervised	The "Machine Learning: Supervised" learning unit is designed to provide students with a deep understanding of supervised learning techniques. Students will learn how to develop, evaluate, and optimize predictive models to solve various classification and regression problems.	6 ECTS	Exam + Practical Assignment	Lecture
Machine Learning: Unsupervised	The "Machine Learning: Unsupervised" learning unit is designed to introduce students to the techniques and algorithms used in unsupervised learning. Students will learn how to apply various unsupervised learning methods to identify clusters, reduce dimensionality, and extract useful features from data.	6 ECTS	Exam + Practical Assignment	Lecture
Neural Networks	The "Neural Networks" learning unit is focused on introducing students to the fundamentals of neural networks, a cornerstone of modern artificial intelligence and deep learning. This unit covers the architecture, functioning, and practical applications of different types of neural networks.	6 ECTS	Exam + Practical Assignment	Lecture
Human-Centered AI	The "Human-Centered AI" learning unit focuses on the integration of humanistic principles into the design, development, and deployment of artificial intelligence systems. This unit explores how AI can be developed to be more interpretable, ethical, and supportive of human needs and values. Students will learn about the importance of designing AI systems that are not only technically proficient but also socially responsible and aligned with human goals.	6 ECTS	Exam + Practical Assignment	Lecture

DECISION MAKERS – CURRICULUM A

1. General information

Name	Decision Makers
EQF level	EQF 6-7
Goals	Equip organizational decision-makers with necessary knowledge of key AI concepts, including machine learning, generative models, and various AI applications such as predictive analytics, computer vision, and natural language processing. This foundational understanding will enable participants to grasp the potential and limitations of AI technologies. Develop participants' skills in evaluating the performance and impact of AI models using appropriate metrics and techniques. The course will also guide participants through the lifecycle of AI projects, from data collection and model training to deployment and maintenance, emphasizing the importance of data quality, governance, and collaboration between technical and non-technical teams to ensure successful AI implementation. Ensure that participants can critically assess and address the ethical implications of AI, including fairness, bias, transparency, and accountability. Additionally, the course aims to provide frameworks and best practices for integrating AI into organizational strategies, aligning AI initiatives with corporate objectives, and leveraging AI for competitive advantage while maintaining ethical standards.
Scope	This course is designed to equip organizational decision-makers, including managers and executives, with a comprehensive understanding of artificial intelligence (AI) and its applications within a business context. The course covers a range of topics, from fundamental AI concepts and machine learning techniques to practical applications in predictive analytics, computer vision, and natural language processing. Additionally, it addresses critical ethical considerations, such as fairness, bias, transparency, and accountability, as well as the current regulatory landscape. Participants will learn methods for evaluating AI model performance, strategies for integrating AI into business operations, and best practices for data governance and project lifecycle management. By blending lectures and case-based learning, the course aims to provide participants with the knowledge and skills needed to effectively and ethically implement and manage AI technologies in their organizations, ultimately leveraging AI for competitive advantage and strategic growth.
Piloted Programme learning outcomes (PLOs)	1 - AI fundamentals (EQF 6) 2 - Organisational decision-making on AI (EQF 7)
References	D4.2 Core Curricula (Annex 4 Core Curricula and Specific Curricula)

Link to the training materials	[Training Materials]()

2. Overview of Piloted Learning Units

Learning unit title	Learning Unit Description	Hours /ECTS	Assessment(s)	Delivery Method(s) of the training materials
Overview of AI fundamentals	This session serves as a comprehensive introduction to the fundamentals of artificial intelligence. Participants will gain an understanding of AI's history and evolution, tracing its development from its early days to contemporary advancements. Key technical terms and concepts will be clearly explained, including machine learning, generative models, and the distinction between narrow and broad AI. The session will lay the foundation for understanding how these concepts fit into the broader AI landscape and prepare participants for more detailed explorations of AI applications and strategies in subsequent sessions.	1 ECTS	Project portfolio	Mostly lecture in this first session, with in-class discussion.
Fields of AI application	This session explores the diverse applications of AI in real-world scenarios, focusing on key areas such as computer vision, natural language processing, autonomous systems, and predictive analytics. Through real-world case studies, participants will see practical examples of AI in action, understanding the benefits and challenges of each application. By the end of this session, participants will grasp the breadth of AI applications and their potential impact on various industries. The specific industry context can be further defined depending on the type of participants and/or the institute where the course will be piloted.	1 ECTS	Project portfolio	First half of the session will be lecturing, second-half of the session will be case-based learning (CBL) activity.
Ethics of AI	This session focuses on the ethical considerations and challenges associated with AI, zooming in on issues such as fairness, bias,	1 ECTS	Project portfolio	Lecture and students activity

	transparency, and accountability. Participants will explore how ethical dilemmas arise in the development and deployment of AI systems and the potential societal impacts of these technologies. The session will cover frameworks and guidelines for ethical AI practices, ensuring that AI implementations are aligned with ethical principles and regulatory requirements.			
Regulatory landscape	This lecture will provide an overview of the current regulatory landscape for artificial intelligence (AI) and data privacy laws. Participants will learn about existing and emerging regulations such as the EU AI Act, data protection laws, sectoral regulatory frameworks, intellectual property (IP) laws, anti-trust/competition laws, consumer protection laws, and cyber and information security laws. By the end of the session, decision-makers will be able to explain these regulatory frameworks and distinguish between them, equipping them with the knowledge to navigate AI compliance effectively. This understanding is crucial for ensuring that AI initiatives within their organizations adhere to relevant legal standards.	1 ECTS	Project portfolio	Lecture and students activity
AI and business strategy	This lecture will explore how AI can be integrated into organizational strategy to drive corporate objectives and create competitive advantages. Participants will learn frameworks for aligning AI initiatives with business strategy, understand the role of AI in creating value, and gain insights into developing an AI vision for their organization. By the end of the session, decision-makers will be equipped with the knowledge to strategically implement AI, ensuring it supports and enhances their business goals. This understanding is crucial for leveraging AI as a transformative tool within their organizations.	1 ECTS	Project portfolio	First half of the session will be lecturing, second-half of the session will be CBL.
Data quality and data management	This lecture will emphasize the critical role of data quality and data governance in the success of AI projects. Participants will learn about	1 ECTS	Project portfolio	First half of the session will be lecturing,

	the principles of data management, the importance of high-quality data, and best practices for establishing robust data governance frameworks. By the end of the session, decision-makers will understand how to ensure data integrity and compliance, which are essential for reliable and ethical AI implementations. This knowledge is fundamental for leveraging data as a strategic asset in AI-driven initiatives.			second-half of the session will be CBL.
Economic and social impact of AI	This unit aims to provide students with a comprehensive understanding of the economic and social implications of AI. It explores how AI technologies are transforming industries, creating new opportunities, and posing challenges for society. Students will learn about the economic impact of AI, including job creation and displacement, economic inequality, and changes in productivity and efficiency. The unit will also examine the social consequences of AI, such as privacy concerns, ethical considerations, and effects on social structures and relationships.	1 ECTS	Project portfolio	Lecture (presential)

DECISION MAKERS - CURRICULUM B

1. General information

Name	Decision Makers
EQF level	EQF 7
Goals	The curriculum aims to provide participants with insights into the regulatory landscape, strategic planning, and hands-on experience with AI technologies, thereby supporting informed decision-making and driving innovation in their organisations. **Goal 1-** Understand the various risks associated with implementing AI solutions within organisations. **Goal 2-** Develop the ability to critically analyze and discuss risk assessments related to AI applications. **Goals 3-** Understand the strategic role of AI in supporting business objectives. **Goal 4-** Gain knowledge of authoritative publications and regulations governing AI. **Goal 5-** Provide practical skills in implementing AI solutions within a business context.
Scope	The curriculum has been designed for mid-career professionals with the objective of providing learners with a comprehensive education on the integration of AI within organisational contexts. The primary target group for this curriculum are professionals who are involved in or responsible for decision-making, strategic planning, or innovation within their organisations. This includes, but is not limited to: • Business Executives • Managers • Legal and Compliance Officers
Piloted Programme learning outcomes (PLOs)	2 - Organizational decision-making on AI (EQF 7)
References	D4.2 Core Curricula (Annex 4 Core Curricula and Specific Curricula)
Link to the training materials	Training Materials

2. Overview of Piloted Learning Units

Learning unit title	Learning Unit Description	Hours /ECTS	Assessment(s)	Delivery Method(s) of the training materials
1- The opportunities of AI	This structured, short-duration unit aims to provide decision-makers with a comprehensive understanding of AI's potential within their organizations, enabling them to critically assess AI proposals and strategically integrate AI solutions. Through this unit, learners will gain the ability to make informed decisions about integrating AI technologies into business operations, ensuring that they can effectively navigate the complexities and opportunities AI presents.	8 hours	Participation (20%) Discussion and project/plan Presentation (80%)	Lecture, case study, discussions, practical activities
2- The risks of AI	This unit aims to equip mid-career decision-makers with the skills to identify, assess, and manage risks associated with implementing AI solutions within their organizations. Participants will learn to interpret risk analyses, evaluate AI implementation proposals critically, and develop strategies to mitigate potential risks. By the end of this unit, learners will be proficient in making informed decisions regarding AI adoption while considering potential risks and their impact on the organization.	8 hours	Participation (20%) Discussion and project/plan Presentation (80%)	Lecture, case study, discussions, practical activities
3- Developing an organizational AI strategy	This 8-hour learning unit aims to equip mid-career professionals with the knowledge and skills necessary to develop and implement a comprehensive AI strategy within their organizations. Participants will gain a deep understanding of authoritative AI publications, relevant laws and regulations, and the strategic application of AI to support corporate objectives. Through case studies and practical exercises, learners will explore best practices and critically evaluate AI proposals, ensuring a well-governed and transparent AI adoption process.	8 hours	Participation (20%) Discussion and project/plan Presentation (80%)	Lecture, case study, discussions, practical activities

DECISION MAKERS AND POLICY MAKERS

1. General information

Name	Decision Makers and Policy Makers
EQF level	EQF 6
Goals	1. **Comprehend AI Fundamentals:** Equip learners with a solid understanding of common AI technical terms and concepts, including key machine learning methodologies and the differences between narrow and broad AI. 2. **Evaluate AI Applications and Performance:** Enable learners to identify and assess the impact and effectiveness of AI applications across various fields, including data analysis, predictive analytics, and decision support. 3. **Understand AI Explainability, Interpretability, and Ethics:** Foster a solid understanding of the principles of AI explainability, ethical considerations, and the regulatory landscape governing AI and data privacy. 4. **Analyse Economic and Social Impacts of AI:** Develop the ability to critically evaluate the economic and social implications of AI technologies, recognizing potential risks and the importance of robust data governance. 5. **Integrate AI Strategically and Lead Ethically:** Provide learners with the skills to integrate AI into organizational strategies effectively, promote collaboration between technical and non-technical teams, and lead AI initiatives with a strong ethical foundation.
Scope	**Scope of the Curriculum:** The curriculum provides a comprehensive and practical education in AI for decision and policy makers, covering a broad range of topics from foundational AI concepts to the strategic integration of AI into organisational frameworks. It encompasses technical terms and concepts, applications and evaluation methods, principles of explainability and ethics, economic and social impacts, and guidelines for ethical leadership in AI. Designed for non-technical professionals, the training employs advanced pedagogical techniques and modern tools to facilitate rapid and effective learning. **Target Groups:** The curriculum is tailored for decision makers, policy makers, and senior management in both the industry and public sector who aim to understand and leverage AI technologies in their strategic initiatives. It is ideal for leaders seeking to enhance their knowledge of AI applications, ethical considerations, and integration strategies to make informed decisions and foster ethical AI practices within their organizations and in society. The curriculum ensures that learners can quickly grasp complex concepts using advanced training techniques and state-of-the-art tools, enabling them to achieve competency efficiently and effectively.
Piloted Programme learning outcomes (PLOs)	1 - AI Fundamentals (EQF 6)

References	D4.2 Core Curricula (Annex 4 Core Curricula and Specific Curricula)
Link to the training materials	Training Materials

2. Overview of Piloted Learning Units

Learning unit title	Learning Unit Description	Hours /ECTS	Assessment(s)	Delivery Method(s) of the training materials
AI Fundamentals for Decision and Policymakers	The learning unit AI Fundamentals for Decision and Policymakers covers common technical terms and concepts, including supervised and unsupervised machine learning, generative models, and the distinction between narrow and broad AI. Trainees learn about data representation, data clustering, dimensionality reduction, classification, evaluation of machine learning models, and intuitively understand a transition to more complex machine learning models such as deep neural networks. The utility of deep neural networks is illustrated on the analysis of images and text. No prior knowledge of statistics or computer science is required to take this course.	25 h / 1 ECTS	Quizzes	On-site lectures with practical demonstrations of methods, tools, and cases; Self-study assisted with pre-recorded video material and interactive lecture notes with quizzes and challenges; On-line discussion and quizzes

POLICY MAKERS AND AI ADVISORS

1. General information

Name	Policy Makers AI Advisors
EQF level	(EQF 6/7)
Goals	- Basic technical knowledge on the functioning of AI systems - Insight into the broader context in which AI systems will be embedded in the public domain - Gain the ability to have a critical conversation about the design and development of AI systems in the public domain - The student investigates, analyses, evaluates and/or identifies the challenges and opportunities of public values, (privacy) legislation, ethical dilemmas that play a role in digital transformation within government services - Student investigates and/or analyses the possibility of using AI models and algorithms (hereinafter referred to as algorithms) with government data. - Student is able to develop new implementations of algorithms for government services, using reliable and transparent methodologies with an emphasis on improving processes, working methods, culture and citizen experience.
Scope	The scope is to introduce public policy makers with the technical basics of AI and about the ethical + legal considerations that arise when implementing AI systems in the public domain. Learning programmes developed in the context of the Minor digital innovations for Society & Government
Piloted Programme learning outcomes (PLOs)	1 - AI fundamentals (EQF 6) 2 - AI and policy (EQF 7) 2 - AI Strategy (EQF 7) 3 - AI implementation (EQF 7) 4 - AI Ethics advanced (EQF 7) 5 - Impact of AI (EQF 7)
References	D4.2 Core Curricula (Annex 4 Core Curricula and Specific Curricula)
Link to the training materials	Training Materials

2. Overview of Piloted Learning Units

Learning unit title	Learning Unit Description	Hours /ECTS	Assessment(s)	Delivery Method(s) of the training materials
Fundamentals of AI (and machine learning)	This learning unit takes the participant into various different levels of AI systems. It starts with introducing the basic concepts involved in machine learning and gradually explains more advanced models. Here the goal is to let the participants understand the functioning of AI systems on a conceptual level and get hands on experience with training their own AI model. By doing so, they gain a better understanding of what they are talking about	3 days	Project portfolio and pitch	Lecture, case
De AI, government and regulatory environment (AI act, WOO - Open Government Act, etc.)	What are these laws and what do they mean for me?	1 day	Project portfolio and pitch	Lecture structure and content
Fairness in AI	Participants gain insight into the ethical considerations when determining 'fairness'. They are introduced to different ways to reduce bias in systems and how a discussion can be held about this	1 day	Project portfolio and pitch	Lecture and student activity
Privacy by design	Providing insight into how privacy can be taken into account when developing applications.	1 day	Project portfolio and pitch	Lecture structure
Value Sensitive Design – designing and taking into account ethical values	Participants gain insight into how ethical values in technology can be measured and how they can be taken into account when designing a system.	1 day	Project portfolio and pitch	Lecture structure

AI ADVISORS

1. General information

Name	AI Advisor-Consultant

EQF level	EQF 6/7
Goals	The programme aims to provide learners with a deeper understanding of what is involved in developing and implementing an AI strategy in an organisation. The participant will get tools to be able to advise organisations on this.
Scope	It is intended for professionals already working in or are very familiar with the ICT field, who want to gain insight about what the development and implementation of an AI strategy in organisations entails, so that they can advise on this within their own organisation or advise others. These professionals have an undergraduate (Bachelors) degree and/or at least five years of working experience as a business or IT consultant.
Piloted Programme learning outcomes (PLOs)	1 - AI fundamentals (EQF 6) 2 - AI Strategy (EQF 7) 3 - AI implementation (EQF 7) 4 - AI Ethics advanced (EQF 7) 5 - Impact of AI (EQF 7)
References	D4.2 Core Curricula (Annex 4 Core Curricula and Specific Curricula)
Link to the training materials	Training Materials

2. Overview of Piloted Learning Units

Learning unit title	Learning Unit Description	Hours /ECTS	Assessment(s)	Delivery Method(s) of the training materials
Understanding the AI Landscape	In this course, the learner will explore the full definition of AI; how it works, and when it can be used, focusing on informative use cases; identify the types of data, as well as the tools and technologies AI uses to operate.	3 ECTS	Exam	(V)ILT
Enhancing work with AI	AI's capabilities are transforming the way companies and customers interact and do business. This course explores the challenges and opportunities that this new technology brings.	3 ECTS	Exam	(V)ILT
AI Guardrails & Governance	In this course, the learner will gain a foundational understanding of ethical guardrails and governance as these apply to the application and use of generative AI technologies in an everyday business context	1 ECTS	Practical assignment	(V)ILT
AI Strategy, Transformation & Implementation	This course addresses strategies to effectively lead organizations through the transformational impact of AI. It explores how AI can be leveraged, how to plan an AI implementation and the issues surrounding it.	6 ECTS	Practical assignment	(V)ILT

arisa

Artificial Intelligence Skills Alliance

www.aiskills.eu

info@aiskills.eu

Co-funded by
the European Union