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ARIS PROJECT
AI SKILLS FOR ICT PROFESSIONALS

Erasmus+

ARIS PROJECT

"AI Skills for ICT Professionals"

3RD AND 4TH SEMESTER RESULTS



Project objectives

- ▶ **To design** a comprehensive and up-to-date training course in AI technologies and practical applications, to empower ICT professionals with initiative, entrepreneurship & updated digital skills required in the workplace.
- ▶ **To introduce** modern training delivery methods and innovative open-access pedagogical resources, enabling learners to acquire and self-assess AI related skills, including VET providers resources & techniques to integrate into their training offerings.
- ▶ **To facilitate** the integration of AI skills requirements into the EU certification and standardization schemes.





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Target groups

- ▶ ICT professionals in need of CVET
- ▶ Students in need of IVET
- ▶ VET providers and employers
- ▶ Sectoral stakeholders
- ▶ Policy-makers
- ▶ Other European learners





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ARIS project partners



Business
Training

- ▶ **BUSINESS TRAINING SA** (Lead partner, Belgium)

- ▶ www.businesstraining.be



LIETUVOS
KOMPIUTERININKŲ
SAJUNGA

- ▶ **Lietuvos kompiuterininkų sąjunga** (Dissemination Leader, Lithuania)

- ▶ www.liko.lt



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

- ▶ **UNIVERSITAT POLITÈCNICA DE CATALUNYA** (Spain)

- ▶ www.upc.edu



Consiglio Nazionale delle Ricerche

- ▶ **CONSIGLIO NAZIONALE DELLE RICERCHE** (Italy)

- ▶ www.cnr.it



EXELIA

- ▶ **EXELIA E.E.** (Greece)

- ▶ www.exelia.gr



Progress made and main results

- ✓ Learning outcomes for training provision in the different AI technologies & practical applications for ICT professionals.
- ✓ Learning units (curriculum structure), trainers' toolkit, and VET integration guidelines.
- ✓ Open Educational Resources for AI technologies and applications.
- ✓ ARIS Vocational Open Online Course infrastructures & content on AI technology applications for ICT professionals.
- ✓ AI Skills Certificate Supplement for the integration of AI skills into certification schemes.
- Position paper to support decision-making and promote the incorporation of AI skills requirements into the European e-Competence Framework.
- 5 national information days (one in each partnership country) to promote ARIS project.



3rd main semester tasks

- ▶ 3rd project meeting in Barcelona (virtually due to COVID-19)
- ▶ Finalization of the 1st quality assurance plan
- ▶ 2nd digital presentation
- ▶ 2nd email campaign
- ▶ Website and social media updates
- ▶ 4th project meeting in Athens (virtual)
- ▶ Finalization of ARIS training and assessment materials in EN (based on partners' feedback)
- ▶ Drafting of the trainer's handbook
- ▶ Delivery of VET integration guidelines
- ▶ Development of the ARIS VOOC (EN)
- ▶ Preparation and submission of the 2nd interim report

Start date: 01-10-2020

End date: 31-03-2021



4th main semester tasks

- ▶ 5th project meeting in Vilnius (virtually due to COVID-19)
- ▶ Digital presentation for 3rd and 4th semesters
- ▶ 3rd email campaign
- ▶ Website and social media updates
- ▶ Development of the ARIS VOOC (EN)
- ▶ Development and fine tuning of additional pedagogical VOOC materials (videos and work assignments)
- ▶ Development of the statement of support
- ▶ Develop the online petition form
- ▶ Development of evaluation form
- ▶ Campaign to circulate the statement of support

Start date: 01-04-2020

End date: 31-08-2021






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3rd semester main outputs

-  ARIS TRAINING AND ASSESSMENT MATERIALS
-  TRAINER HANDBOOK
-  VET INTEGRATION GUIDELINES REPORT







Artificial Intelligence (AI) skills for ICT professionals



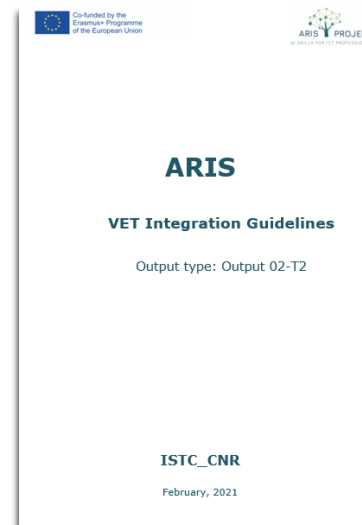
ARIS PROJECT
AI SKILLS FOR ICT PROFESSIONALS

Artificial Intelligence, Machine Learning, Big Data, Robotics, Natural Language Processing, Deep Learning, Artificial Neural Networks, Business Intelligence

Artificial Intelligence (AI) is revolutionizing the way the economy and society function. by

-  **Credential type**
Certificate of completion
-  **Start date**
Start any time
-  **Duration**
Flexible
-  **Cost**
Free

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ARIS learning units

- ✓ Unit 1: Foundations of Artificial Intelligence
 - ▶ Defines the essential AI characteristics.
 - ▶ Addresses the fundamental features of AI applications.
- ✓ Unit 2: Machine Learning
 - ▶ Defines the foundations for Machine Learning.
 - ▶ Teaches how to select the right ML model and to implement it in a given domain.
- ✓ Unit 3: Artificial neural networks (ANNs) and deep learning for vision
 - ▶ Provides the knowledge, skills, and competence to apply big data analysis to large datasets and deep learning to vision.
- ✓ Unit 4: Deep learning for natural language processing and big data analysis
 - ▶ Provides the knowledge, skills, and competence to apply deep learning to Natural Language Problems and Big Data analysis to large datasets.

Machine Learning

SUPERVISED LEARNING

Supervised learning algorithms assume that we have a dataset that describes **examples** of our problem.

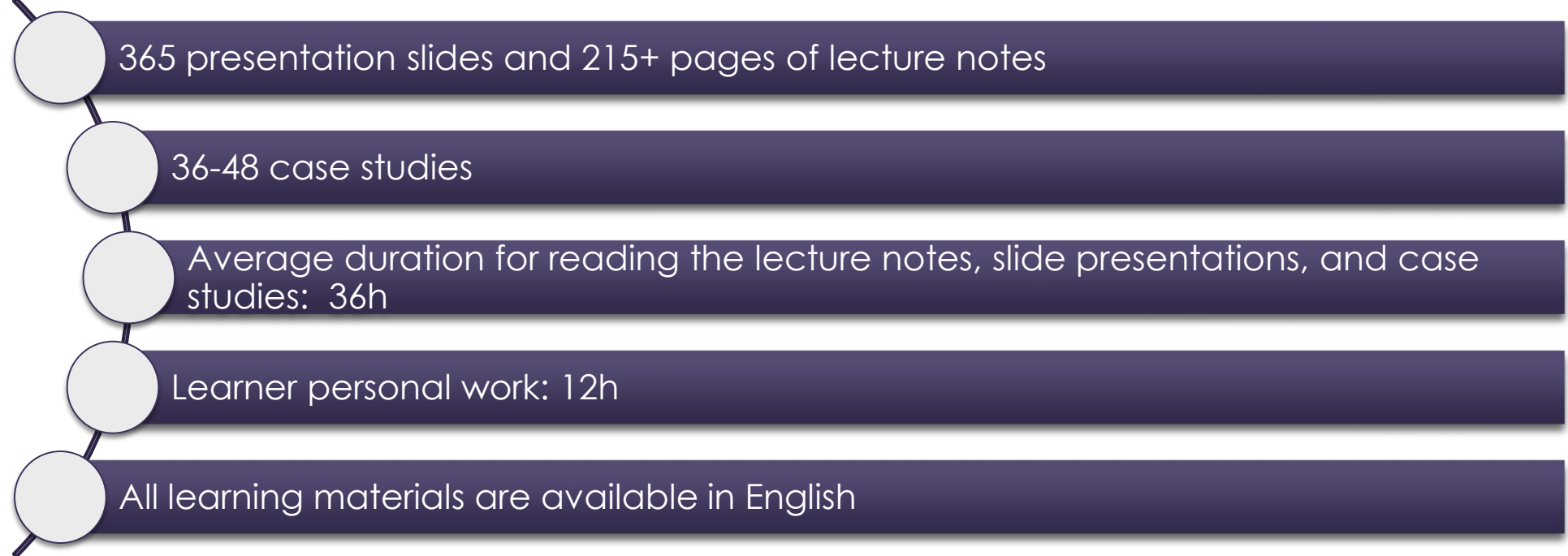
Each example has an **input** that is a set of characteristics that define an instance of the problem and an **output** that is the correct answer.

A supervised task is **classification** if the output for each example is one of a discrete set of labels.



Training and assessment materials

- ▶ ARIS training and assessment materials are developed so to respond to skills requirements and demands in the EU workplace.
- ▶ ARIS training materials consist of:





Training and assessment materials (2)

- ▶ ARIS training assessment materials consist of:



- ▶ All materials can be found on ARIS website aris-project.eu, and in the form of an online course www.openlearning.com/courses/artificial-intelligence-ai-skills-for-ict-professionals



Trainer handbook

The main purpose of this report is to provide guidelines for trainers which will help them achieve the training goals.

This document includes the trainer's guidelines on

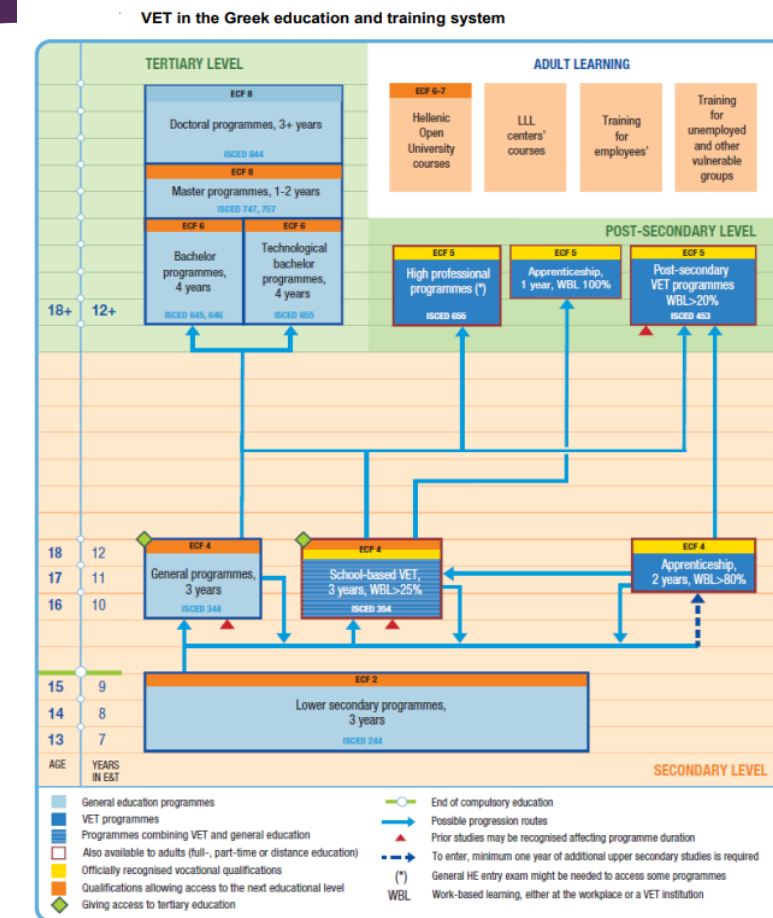
- ▶ how to use the training material (slides, videos, case studies and exercises) to
- ▶ maximize the learning outcomes achievement, a short methodology and instructions
- ▶ on how to facilitate the remote training making use of MOOC's supported tools.

The screenshot displays a MOOC interface for the course "Artificial Intelligence Skills for ICT Professionals". The top navigation bar includes a "Home" button, the course title, and a "Your Progress" indicator. A left sidebar menu lists course sections: "Welcome Activity", "L1. Foundations of Artificial Intelligence", "L2. Introduction to Machine Learning", "L3. Neural Networks and Deep Learning for Vision", and "L4. Deep Learning for Natural Language Processing and Big Data Analysis", along with "Announcements", "Students Area", "Course Feed", "Course Setup", "Administer Learners", "Assessment", and "Credentials". The main content area shows the "Students Area" with a header image of four diverse professionals holding large speech bubbles. Below the image, a text prompt reads: "This page is a discussion and sharing space for course participants. Found something interesting? Share it with your class!". At the bottom, there is a sharing toolbar with icons for "Thought", "Image", "Video", "Link", and "File".



VET integration guidelines

- ▶ The guidelines aims to facilitate the introduction and integration of the developed ARIS learning units into existing training courses for ICT Professionals.
- ▶ These VET Integration Guidelines provide instructions on how to:
 - a) implement training making use of the ARIS learning units,
 - b) attribute the most appropriate reference levels to learning units according to the partnership countries' National Qualification Frameworks (NQFs) as detailed in CEDEFOP country reports for Vocational Education and Training (VET);
 - c) develop additional units fitted to their current training programs.
 - d) a practical example on how an existing VET programme could be modified to include the ARIS learning outcomes and units.





4th semester main outputs

- Development and fine tuning of additional pedagogical VOOO materials (videos and work assignments) - <https://www.openlearning.com/courses/artificial-intelligence-ai-skills-for-ict-professionals>
- Development of the statement of support - <https://forms.gle/c6t86CwfdTFbzFui8>
- Development of the VOOO evaluation form - <https://forms.gle/EKFuuKsjbRdcinzZA>

ARIS PROJECT Unit4 **ARIS PROJECT Unit3** **ARIS PROJECT Unit2** **ARIS PROJECT Unit1**

STATEMENT OF THE SUPPORT FOR THE RECOGNITION OF THE ARIS LEARNING OUTCOMES AND RESULTS



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ARIS online course on Openlearning.com

- ▶ Please visit [Openlearning.com](https://openlearning.com) platform and join ARIS “Artificial Intelligence (AI) skills for ICT professionals” course
- ▶ On the course's homepage, you can find a warm welcome to the class and an explanation about what the course is all about
- ▶ Detail descriptions of the learning units and the skills that course seeks to develop are presented in the syllabus part

Artificial Intelligence (AI) skills for ICT professionals

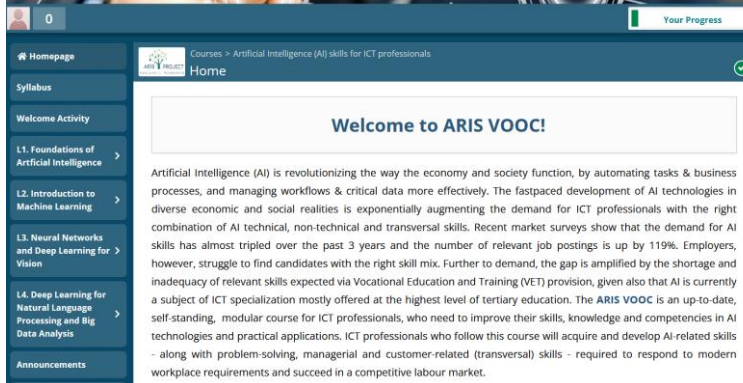


ARIS PROJECT
AI SKILLS FOR ICT PROFESSIONALS

-  Credential type
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Flexible
-  Cost
Free

Artificial Intelligence, Machine Learning, Big Data, Robotics,

JOIN NOW



0 Your Progress

Home

Welcome to ARIS VOOC!

Artificial Intelligence (AI) is revolutionizing the way the economy and society function, by automating tasks & business processes, and managing workflows & critical data more effectively. The fastpaced development of AI technologies in diverse economic and social realities is exponentially augmenting the demand for ICT professionals with the right combination of AI technical, non-technical and transversal skills. Recent market surveys show that the demand for AI skills has almost tripled over the past 3 years and the number of relevant job postings is up by 119%. Employers, however, struggle to find candidates with the right skill mix. Further to demand, the gap is amplified by the shortage and inadequacy of relevant skills expected via Vocational Education and Training (VET) provision, given also that AI is currently a subject of ICT specialization mostly offered at the highest level of tertiary education. The ARIS VOOC is an up-to-date, self-standing, modular course for ICT professionals, who need to improve their skills, knowledge and competencies in AI technologies and practical applications. ICT professionals who follow this course will acquire and develop AI-related skills - along with problem-solving, managerial and customer-related (transversal) skills - required to respond to modern workplace requirements and succeed in a competitive labour market.



ARIS online course content

- ▶ Each learning unit are split into the lessons
 - ▶ You can select any lesson from the course at any time
 - ▶ You can observe which lesson you have completed and what is your overall progress.
- ▶ Each lesson consist of 5 parts:
 - ▶ Technical content presents learning materials in form of slides
 - ▶ Question and answers section provides some main questions and answers to them
 - ▶ Use cases section gives examples where you can apply learned materials
 - ▶ Practical examples consist of multiple exercises
 - ▶ Questionnaires are for evaluating the trainee skills

The screenshot displays the ARIS online course interface. At the top, it reads "ARTIFICIAL INTELLIGENCE SKILLS FOR ICT PROFESSIONALS". Below this, there is a progress bar showing "0" and "Your Progress". A sidebar on the left contains navigation options: Homepage, Syllabus, Welcome Activity, L1. Foundations of Artificial Intelligence, L2. Introduction to Machine Learning, L3. Neural Networks and Deep Learning for Vision, L4. Deep Learning for Natural Language Processing and Big Data Analysis, and Announcements. The main content area shows a list of lessons with their completion status:

Lesson	Completed
Introduction to Learning Unit 1	Completed: 1 of 1
L1.1: Scope of Artificial Intelligence	Completed: 5 of 5
L1.2: Problem Solving with Search Algorithms	Completed: 1 of 5
L1.3: Knowledge Representation	Completed: 0 of 5
L1.4: Machine Learning	Completed: 0 of 5
L1.5: Applications of Artificial Intelligence	Completed: 0 of 5
L1.6: Ethical Implications of Artificial Intelligence	Completed: 0 of 5
L1. Final self-assessment	Completed: 0 of 1

Below the lesson list, the interface shows the "L2.1: Introduction to Machine Learning" lesson overview, which is "Completed: 0 of 5". This overview includes five sections: THEORETICAL CONTENT, QUESTIONS AND ANSWERS, USE CASES, PRACTICAL EXERCISES, and QUESTIONNAIRE, each represented by a small image.

1. What kinds of problems can be solved using machine learning?

Machine learning can be used for problems that can not be solved by coding an algorithm manually. Machine learning can use examples gathered from the problem to build a model that approximates the algorithm that solves the problem.



Upcoming activities

- ▶ **Pilot run** from 4 October 2021 to 12 November 2021
 - ▶ Please register and join the pilot run on Openlearning.com
<https://www.openlearning.com/courses/artificial-intelligence-ai-skills-for-ict-professionals>
 - ▶ Complete all course or part of it
 - ▶ Give your valuable feedback by submitting the evaluation form
<https://forms.gle/EKFuuKsjbRdcinzZA>
 - ▶ If you find the project results and activities valuable for you or your company please express your support by submitting **Statement of Support**
<https://forms.gle/c6t86CwfdTFbzFui8>
- ▶ Please visit aris-project.eu to get information about upcoming **5 national information days** in Lithuania, Greece, Italy, Spain, and Belgium



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- ▶ [twitter.com/aris ai project](https://twitter.com/aris_ai_project)
- ▶ facebook.com/aris.ai.project
- ▶ youtube.com/channel/UCc7lqoPHLZGtCmU7gg61iUg

