ALL DIGITAL ACADEMY

Upskilling adult educators on key emerging digital technologies

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INTERNET OF THINGS (IoT) MOOC

| in alldigital-aisbl | f AllDigitalEU | **Starts February 19th 2024** | ⊙ alldigitaleu | 🐦 AllDigitalEU |

ENHANCING DIGITAL SKILLS ACROSS EUROPE

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Italy
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Co-funded by the European Union

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About the project

With rapidly evolving digital technologies becoming an integral part of economic, social and daily life in Europe, digital competencies should be one of the core skills for all educators and training staff today.

ADA aims to help adult educators and trainers to keep up with the digital transformation through training and capacity building activities on emerging digital technologies, with focus on Artificial Intelligence (AI) and Internet of Things (IoT).

The main objectives of the ADA project are:

- **Upskilling adult educators working in the field of digital inclusion** through the provision of high-quality online training on key emerging digital technologies and enhancing their knowledge on AI and IoT to create meaningful learning experiences for adults on these topics

- **Strengthening the capacity of adult education organisations** to get ready in introducing training activities on emerging technologies in their educational offer and increasing their impact in digital transformation

- **Promoting transnational cooperation and exchange** through the nurture of a Community of Practice as the main hub for digital competence stakeholders from all sectors to connect and share

The ADA project aims to achieve these objectives by offering:

- **Online training:** Massive Open Online Courses (MOOCs) and Open Educational Resources (OERs) on AI and IoT

- **DigComp-based resources:** Tools, methodologies, webinars and best practices

- **Community of Practice (CoP):** A hub for digital competence practitioners and stakeholders to connect and exchange practices

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The ADA IoT MOOC at a glance

- **Classes start:**
  19 Fubruary 2024

- **Classes end:**
  30 March 2024

- **Estimated effort:**
  2 hours per week for 12 weeks, for a total of 24 hours including an estimated study time

- **Studying method:**
  Courses and materials are entirely self-administered

- **Tutors:** No synchronous sessions but online tutors will be available for questions

- **Level:** Beginner

- **Language:** English

What's in for you?

Pre-assessment

Before starting the course, each participant will take self-assessment tests on their current knowledge and attitude with respect to the IoT technology.

Module Completion

At the end of each module, there will be an assessment test leading to a score. The learner will be able to move to the next module regardless of the score.

Certification

At the end of the course, each participant will take a second round of knowledge and attitude self-assessment tests, and a short survey on their course experience.

Participants will receive a certificate of successful course completion, based on the average of their module scores (i.e. average score equal or above 60%).

Adult educators and trainers completing the IoT MOOC will:

- get equipped with the basic understanding and skills on IoT

- feel more confident in setting up and delivering courses and learning experiences on AI and IoT for adult learners

Register for the ADA IoT MOOC

https://platform.alldigitalacademy.eu

Starts February 19th 2024

NO FEES APPLY

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IoT MOOC Modules

Module	Name
1	Introduction to IoT
2	IoT fundamentals
3	The "things" in IoT
4	Interconnection and communication
5	Computing architectures
6	Hardware IoT platforms
7	Software tools for IoT applications development
8	From data to knowledge
9	User interaction
10	Security, privacy and ethics
11	The business end of IoT
12	Selected use cases

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IoT Competences

Module 1.
Introduction to IoT

This module welcomes knowledge seekers into the world of IoT. Learners are introduced to the concept of IoT from an easy-to-understand physical point of view, and an attempt is made to provide a concrete definition conceptualising the meaning of this term. This is later followed by a logical sequence of historical milestone events, enabling the audience to gain an understanding about how the IoT entered our world and its potential as a technology that can be applied into the various application domains. By the end of this module, the trainee will be in position to understand and explain the basic concept of the underlying technologies, as well as the added value IoT brings in a range of everyday personal and professional activities.

Module 2.
IoT fundamentals

Tightly coupled with Module 1, this module dives into the inner layer of IoT by describing the technical challenges and obstacles surrounding the matter, and how this is impacting the emergence of such undertaking. Sequentially, a deeper look into the components and architectures of IoT follows, explaining how those elements are interconnected, what side technologies are enabling the IoT and how this is forming a functional composition that materialised into today's life-changing trend. By the end of this module, the trainee will be in position to understand and explain beyond the basic definition, the IoT fundamentals including challenges, components, architectures, and enabling technologies.

Module 3.
The "things" in IoT

This module puts an emphasis on the "things" composing IoT. Surveying what the "things" are, it follows a structured approach categorising them into fine segments by their role and usage in the emerging ecosystem. Trainees will be introduced to the various devices including sensors and actuators while their characteristics and peculiarities will be explained in detail. By the end of this module, the trainees will be made familiar with terminology, operational principles and the taxonomy of the "things" of IoT.

IoT Competences

Module 4.
Interconnection and communication

Interconnection and communication of devices is a core aspect of the Internet of Things concept. A vast diversity of computing and software platforms appears alongside the Things attached to the internet, causing issues of interconnection and interoperability among them. This module will offer an introduction to key Internet of Things standards regarding communication architectures, protocols, and technologies. The concept of Application Programming Interfaces (APIs) will also be introduced to explain how the different components of Internet of Things make their properties and functionality available to each other.

Module 5.
Computing architectures

Distributed computing and storage is a necessity when it comes to resource allocation for Internet of Things based solutions. This module will introduce learners to the distributed computing's paradigm used in the context of Internet of Things, describing the topology of cloud, fog, and edge nodes. It will also walk the learners through the art of balancing and fine tuning the assignment of computing and storage needs of different solutions to edge, fog and cloud resources.

Module 6.
Hardware IoT platforms

A variety of proven Internet of Things hardware platforms will be presented in this module, including Arduino, Espressif and Raspberry Pi. Key aspects of these platforms such as cost, energy efficiency and connectivity capabilities will be compared. A series of practical examples will also be provided to help the learners kick off their own do-it-yourself prototyping projects.

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IoT Competences

Module 7.
Software tools for IoT applications development

Both the open-source community and established software vendors work hard to catch up with the evolution of Internet of Things technologies. This module provides a comprehensive guide to the software tools and components that is made possible to turn an idea into an Internet of Things solution.

Module 8.
From data to knowledge

The Internet of Things is a producer of massive amounts of raw data. How is it possible to transform volumes of unintelligible little pieces of information into insightful and actionable awareness? Here, we will explore the long, yet often instantaneous journey from data to knowledge that was made possible by technologies such as Big Data, Artificial Intelligence and Machine Learning.

Module 9.
User interaction

User interaction, in traditional terms, refers to the interfacing methods for controlling, monitoring, and configuring devices supporting the Things. However, in the era of ubiquitous and pervasive computing, there are new emerging ways of interaction between users and machines which are more implicit, subtle, and natural, such as speech and gestures. This module will focus on the traditional interfacing methods but also highlight the novel interaction methods that were made possible by the use of sensors and actuators.

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IoT Competences

Module 10.
Security, privacy and ethics

This module explores the main privacy concerns that arise along side the emergence of the IoT paradigm. The privacy cost and the counter measures on the legislative front as well as the ethics behind such decisions are examined. Along these lines, the security aspect of IoT, various threats including the risks involved, and the human factor in all this are explained. By the end of this module the trainee should be familiar with the concerns and ramifications of the security dilemma surrounding IoT adoption.

Module 11.
The business end of IoT

While technologies evolve and common standards are accepted, the market, that is the companies and entrepreneurs comprising it, are cynically seeking for business value to fuel their motives with. Inspired by its applications, this module explores the monetisation of the IoT technology, answering questions of business nature in terms of how a certain technology stack can be utilised to produce value and a place in the market. By the end of this module the trainee will be familiar with the business concepts of the IoT technology.

Module 12.
Selected use cases

In this module the learners take a journey into the IoT use cases across the industries with an emphasis on sustainability. It is explained how IoT can in practice promote sustainability in different domains such as energy efficiency, waste management, transportation and more. By the end of this module the trainees will be familiar with the use of the underlying IoT-driven technologies towards achieving a more sustainable future.