MOBILITY FRIENDS TRAINING CENTER • COURSE PROGRAM

STEM AND TECHNOLOGICAL INNOVATION

Programming and Development

INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Your Mobility Partner

PIC Number: 948037649 | **Organisation ID:** E10207576

COURSE OVERVIEW

Introduction to Artificial Intelligence and Machine Learning offers a practical and accessible entry point into two of the most transformative technologies of our time. Through hands-on programming tasks, guided exercises, and real-world examples, participants will explore how intelligent systems are built, how machines learn from data, and how these models are used in everyday applications — from recommendations and automation to image recognition and decision-making tools. The course focuses on core AI and ML concepts such as supervised and unsupervised learning, model training, evaluation, and basic data handling. Participants will experiment with simple algorithms using Python and gain confidence in working with data-driven solutions. By the end of the course, learners will have developed and tested basic AI models and understood how to apply them in practice, laying the foundation for further exploration in this fast-evolving field.

TARGET AUDIENCE

This course is designed for participants who want to gain a practical understanding of Artificial Intelligence and Machine Learning, with a focus on how these technologies work and how to apply them using code and data. It is ideal for individuals who are curious about intelligent systems, automation, and how machines can learn from experience. Participants should be open to working with data and writing basic Python code. The course is especially suitable for those interested in exploring real-world applications of AI through hands-on practice, simple models, and guided projects.

REQUIREMENTS

To take part in the course, participants must meet the following requirements:

- Have at least a B1 level of English (independent user);
- Complete and submit the registration form before the start of the training;
- Bring a laptop or tablet to use during the sessions;
- Commit to active participation and attend at least 80% of the course.

COURSE OBJECTIVES

The objectives of the course are:

- Understand what Artificial Intelligence and Machine Learning are, and how they are used in real-world contexts.
- Learn to work with data sets and prepare data for basic AI/ML models.
- Explore key machine learning concepts such as classification, regression, training, testing and evaluation.
- Write and run simple Python scripts to create, train and test basic machine learning models.
- Develop a small, functional AI-based application using the skills acquired during the course.

CONTACTS AND REGISTRATION

For registrations, additional information, or budget requests, please contact our team by email at trainingcourses@mobilityfriends.org or visit our website at www.mobilityfriends.org .

LEARNING OUTCOMES

Upon successful completion of this course, learners will be able to:

1. Explain the fundamental concepts of Artificial Intelligence and Machine Learning.
2. Distinguish between supervised and unsupervised learning approaches.
3. Load and explore basic data sets using Python (e.g. CSV files).
4. Perform simple data preprocessing tasks (e.g. handling missing values, normalising data).
5. Use Python and machine learning libraries (such as `scikit-learn`) to train simple models.
6. Apply classification and regression techniques to small real-world problems.
7. Evaluate model performance using basic metrics (e.g. accuracy, confusion matrix).
8. Develop and present a small AI/ML project based on a practical dataset.
9. Understand the ethical considerations and limitations of AI systems.

METHODOLOGY

The course is structured around a rigorous methodology that combines theoretical exposition, practical work, and applied demonstrations. This approach ensures a thorough understanding of the subject matter and its direct application in real-world contexts.

Theoretical sessions provide essential foundations, while practical work and demonstrations facilitate the development of technical skills and familiarity with the specific tools and procedures relevant to the course.

Continuous monitoring through individualized feedback allows for tracking learners' progress and ensures the achievement of the set objectives, preparing participants to face professional challenges with competence and precision.

ASSESSMENT

Assessment is carried out continuously throughout the course, using a holistic and learner-centered approach that reflects both participation and performance. Each participant is evaluated based on their overall engagement, regular attendance, punctuality, interest in the topics covered, ability to apply knowledge during practical tasks, and interaction with peers in individual and group activities.

The evaluation process includes a variety of classroom-based tasks (oral and written), short daily assignments, role-plays, and simulations. Trainers provide ongoing, individualized feedback to support progress and encourage active learning.

A Certificate of Participation is awarded to participants who attend at least 80% of the sessions and demonstrate consistent involvement and commitment during the training.

DURATION

The standard duration of our course is 20 hours (5 days), designed to ensure comprehensive and effective learning. However, this duration can be adjusted, in specific cases, to meet the particular needs of each group, in order to optimize outcomes and better suit the training context.
For further details or to discuss a customized schedule, please get in touch with us.

PRICE AND FUNDING

Each quotation is personalized and depends on several factors, such as the number of participants, the number of training hours, the location of the course, and any additional services requested (accommodation, transport, meals, cultural activities, etc.).
To receive a tailored quotation for your group, please get in touch with us.
The training can be funded through programs such as Erasmus+ (KA1 – Learning Mobility), among other European support mechanisms. For more information about funding, participants should contact their sending organization or their country's National Agency directly.

LOCATION AND COURSE LANGUAGE

We have training rooms in several cities in Mainland Portugal, such as Barcelos (headquarters), Braga, Póvoa de Varzim, and Porto. We also have spaces in the islands of Madeira (Funchal) and the Azores (Ponta Delgada). Additionally, we have facilities in Valencia, Spain.
The course is delivered in English.

CERTIFICATION

A Certificate of Participation is awarded to participants who attend at least 80% of the sessions and demonstrate consistent engagement and commitment throughout the training. Upon completion of the course, a formal certification ceremony will take place, during which the certificates will be presented to the participants.

OTHER SERVICES

To enrich the training experience, Mobility Friends offers a range of additional services, subject to availability and additional cost, which can be arranged for individual participants or groups.
Services include:

- Accommodation in partner residences or hotels
- Meals (lunch and/or dinner)
- Transfers between the accommodation and the training room
- Airport transfers
- Cultural visits

All services are subject to availability and must be requested in advance. For more information and personalised quotes, please contact our team.

COURSE CONTENTS

MODULE 1: INTRODUCTION TO AI AND MACHINE LEARNING

- What is Artificial Intelligence?
- What is Machine Learning and how is it different from traditional programming?
- Types of Machine Learning: supervised, unsupervised, reinforcement learning (basic overview).
- Real-world applications of AI/ML in different fields (health, finance, education, industry, etc.).
- Key concepts: model, algorithm, data set, features, labels, training and testing.
- Introduction to the workflow of an ML project.

MODULE 2: INTRODUCTION TO PYTHON FOR AI

- Overview of the Python programming environment.
- Using notebooks (Jupyter or Google Colab) for data science.
- Variables, data types, lists, and dictionaries in Python.
- Conditional statements and loops.
- Functions and modular code basics.
- Importing and using external libraries (`pandas`, `numpy`, `matplotlib`, `scikit-learn`).

MODULE 3: WORKING WITH DATA

- Loading and exploring structured data (CSV files) using `pandas`.
- Understanding data frames, columns, rows, indexing and filtering.
- Cleaning and preparing data: handling missing values, type conversion.
- Feature selection and basic visualisation (`matplotlib`, `pandas.plot`).
- Splitting data into training and testing sets.

MODULE 4: BUILDING YOUR FIRST ML MODEL

- Understanding supervised learning
- Introduction to classification and regression
- Training a model with `scikit-learn`: `fit()` and `predict()`.
- Simple algorithms: k-Nearest Neighbors, Linear Regression.
- Making predictions and interpreting basic outputs.
- Common challenges: overfitting and underfitting.

*Please note that program content may be subject to change based on input from our trainers.

COURSE CONTENTS

MODULE 5: EVALUATING MODEL PERFORMANCE

- Key metrics: accuracy, precision, recall, F1 score.
- Confusion matrix: reading and interpreting results.
- Cross-validation basics.
- Visualising results with graphs and plots.
- Adjusting model parameters (intro to hyperparameter tuning).

MODULE 6: UNSUPERVISED LEARNING AND CLUSTERING

- What is unsupervised learning?
- Introduction to clustering algorithms: K-Means.
- Practical use cases: grouping data without labels.
- Visualising clusters and understanding results.
- Limitations and interpretation of clustering models.

MODULE 7: FINAL PROJECT - BUILDING A SIMPLE AI SOLUTION

- Project definition: choose a small dataset and define a problem to solve.
- Preparing and cleaning the data set.
- Selecting and training a model.
- Evaluating performance and adjusting.
- Presenting results with plots and explanations.
- Group or individual project presentation and reflection.

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