Artificial Intelligence Skills Certificate supplement

1. Title of the certificate [1]

Example: Τεχνικός Λογισμικού Η/Υ (EL)

2. Translated title of the certificate [2]

Example: Software Technical Designer (EN)

3. Profile of skills and competences

Individual Units

- Learning unit 1: Foundations of Artificial Intelligence
    - L1.1.: Scope of Artificial Intelligence
    - L1.2: Problem-solving with search algorithms
    - L1.3: Knowledge representation
    - L1.4: Machine Learning
    - L1.5: Applications of Artificial Intelligence
    - L1.6: Ethical implications of Artificial Intelligence
- Learning unit 2: Machine Learning
    - L2.1: Introduction to ML
    - L2.2: Languages and Resources
    - L2.3: Data Transformation and Visualization
    - L2.4: Linear Methods for Supervised Learning
    - L2.5: Non-Linear Methods for Supervised Learning
    - L2.6: Unsupervised Learning
- Learning unit 3: Neural Networks and Deep Learning
    - L3.1: Brain & Neural Networks
    - L3.2: Simple Perceptrons and Supervised Learning
    - L3.3: Multilayer Perceptrons and Keras
    - L3.4: Deep Learning for Image Classification
    - L3.5: Different CNN for Image Classification
    - L3.6: Object Localization: YOLO_v3 model
- Learning unit 4: AI for solving real-life problems
    - L4.1: Word Embedding and Text Classification
    - L4.2: Neural Networks for NLP and Libraries
    - L4.3: New Approaches, applications, open problems
    - L4.4: Big Data: problems, techniques, Hadhoop

[1] In the original language. | [2] If applicable. This translation has no legal status. | [3] If applicable.

- L4.5: Big Data: Hadhoop and Spark
- L4.6: Big Data: analytics, visualization, applications

Learning Outcomes

The holder of this certificate will be able to demonstrate the following knowledge, skills and competences:

- Explain the scope of AI differentiating applications from methods and techniques
- Identify a potential application of AI and critically chose the AI sub-field that may be applied
- Provide examples of problems that must be addressed with deterministic or probabilistic AI methods
- Differentiate the knowledge representation, learning and reasoning components in a given AI system
- Explain the ethical implications of an AI deployment and anticipate the ethical dilemmas that may have to be addressed
- Provide examples of the different ML types of problems
- Identify the ML component in a software system
- Communicate the potential of ML methods critically telling advantages and disadvantages with respect more traditional approaches
- Formalize requirements of a ML solution, collect the set of methods that may be applied and critically design a plan to test and evaluate the different alternatives, for a given problem.
- Identify languages and other resources for specific ML applications
- Recognize the relevant data by choosing the right visualizations and the right transformation from raw noisy data.
- Design a plan for testing a ML solution, evaluate its performance and validate its accuracy.
- Code a neuron activation, sigmoid/ReLU, and NN spreading
- Code and train a perceptron from scratch to solve a basic classification problem (AND/OR)
- Implement a deep NN with Keras
- Implement a convolutional NN with Keras
- Solve problems of object recognition with a NN and Keras
- Solve problems of object localisation with NN and Keras
- Implement methods and techniques for text embedding
- Develop and test NN for Natural Language Processing
- Develop and test NN for sentiment analysis
- Recognise different big data problems and choose the techniques for their solution
- Perform analytics of large datasets with Hadoop and Spark
- Collect, clean, store, manipulate, analyse and visualise large datasets

4. Range of occupations accessible to the holder of the certificate [3]

251 - Software and applications developers and analysts

- Computer scientist
- Data analyst
- Data quality specialist
- Data scientist
- Digital games developer

252 - Database and network professionals

- Data warehouse designer
- Database administrator
- Database designer
- Database developer
- Database integrator

[1] If applicable.

- Embedded system designer
- Enterprise architect
- Green ICT consultant
- ICT auditor manager
- ICT business analysis manager
- ICT business analyst
- ICT consultant
- ICT disaster recovery analyst
- ICT intelligent systems designer
- ICT quality assurance manager
- ICT research consultant
- ICT system analyst
- ICT system architect
- ICT system developer
- ICT system integration consultant
- ICT test analyst
- integration engineer
- IT auditor
- Search engine optimisation expert
- Software tester
- User experience analyst
- User interface designer
- Web content manager
- Web developer
- ICT capacity planner
- ICT network architect
- ICT network engineer
- ICT system administrator

5. Official basis of the certificate

Body awarding the certificate

Example:

IEK AKMI
16, Kodrigktonos str., Athina 112 57
https://iek-akmi.edu.gr/

Authority providing accreditation / recognition of the certificate

Belgium: Walloon Government
Rue Mazy, 25-27, 5100 Jambes - Belgium
gouvernement.wallonie.be

Spain: Competent body of the autonomous community
C/ Alcalá nº 36, 28014 Madrid- Spain
http://www.educacionyfp.gob.es

Lithuania : Ministry of Education, Science and Sport
A. Volano g. 2, 01516, Vilnius- Lithuania
https://www.smm.lt/

Netherlands: Ministry of Education, Culture and Science, Rijnstraat 50
2515 XP, The Hague-Netherlands

[1] If applicable.

https://www.rijksoverheid.nl/

Italy: Ministry of Education, University and Research (MIUR) Viale Trastevere, 76 / a

00153, Rome- Italy

www.istruzione.it

Greece: National Organization for the Certification of Qualifications and Vocational Guidance (EOPPEP) Ethnikis Antistaseos 41, Nea Ionia, 142 34 Athens-Greece.

https://www.eoppep.gr/index.php/el/

Level of the certificate (national or European) [1]

Level 4 in the European Qualifications Framework

Grading scale / Pass requirements

Written Assignments

Examination

Pass rate: ≥ 50%

Access to next level of education / training [1]

n/a

International agreements on recognition of qualifications[1]

n/a

Legal basis

6. Officially recognised ways of acquiring the certificate

Replace with a description of the way the certificate can be acquired (apprenticeship, school/training centre-based or workplace-based, accredited prior learning) and/or complete the table below.

Description of vocational education and training	Percentage of total programme (%)	Duration (hours/weeks/months/years)
School based	100 %	64 hours of guided learning

7. Additional information

Entry requirements [1]

There are no specific entry requirements or prior knowledge on Artificial Intelligence. Candidates are expected to have at least a basic ICT background, and appropriate knowledge of Python programming language

More information (including a description of the national qualifications system)

- Belgium: http://enseignement.be/index.php
- Greece: http://www.nqf.gov.gr | https://proson.eoppep.gr/en
- Spain: https://www.forem.es/informacion/sistema-nacional-de-cualificaciones
- Italy: www.anpal.gov.it/europa/europass
- Lithuania: https://www.smm.lt/

National Europass Centre

- Belgium: http://www.moneuropass.be/

[1] If applicable.

- Greece: https://europass.eoppep.gr/
- Spain: www.sepie.es/iniciativas/europass
- Italy: www.anpal.gov.it/europa/europass
- Lithuania: https://europass.lt/

[1] If applicable.