

# Artificial Intelligence for High School Teachers

Course code: MLC\_IFT

This intensive five-day long course is intended for all high school teachers who want to start teaching artificial intelligence at their school but don't have enough experience and knowledge in the field. The course covers the basics of artificial intelligence and machine learning and ends with the design of simple artificial neural networks in Python. The teaching materials (presentations and practical exercises) are prepared such that teachers can use them in their classes without further effort.

Affiliate	Duration	Course price	ITB
Praha	5	19 990 Kč	0
Brno	5	19 990 Kč	0
Bratislava	5	835 €	0

The prices are without VAT.

## Course terms

Date	Duration	Course price	Type	Course language	Location
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The prices are without VAT.

### Required skills

- basic knowledge of programming in Python

### Course outline

#### Day 1

- Introduction to artificial intelligence
- What is artificial intelligence, general and narrow AI
- Artificial intelligence subfields (machine learning, state space search, optimization, planning, AI perception, natural language processing)
- Examples of AI applications, history of AI
- Data and information
- Difference between data and information, data sets and their creation, structured and unstructured data, big data and their treatment
- Intuition vs. facts, examples of intuition failures, data-driven decision
- Basics of descriptive statistics, data visualization
- Data representativeness, bias in data, personal data and GDPR

#### Day 2

- Introduction to machine learning and its applications
- What machine learning is, generalization vs. memorization, the process of machine learning, supervised and unsupervised machine learning
- Classification, regression, clustering, reinforcement learning
- Selected applications of image processing, natural language processing, recommendation and games
- Philosophy of artificial intelligence
- Turing test and Chinese room argument
- Exponential growth, AI safety, fairness and ethics

#### Day 3

- Basics of data analysis in Python
- Introduction to Python, Jupyter notebooks and Google colab
- Data processing in Pandas, practical examples

#### GOPAS Praha

Kodaňská 1441/46  
101 00 Praha 10  
Tel.: +420 234 064 900-3  
[info@gopas.cz](mailto:info@gopas.cz)

#### GOPAS Brno

Nové sady 996/25  
602 00 Brno  
Tel.: +420 542 422 111  
[info@gopas.cz](mailto:info@gopas.cz)

#### GOPAS Bratislava

Dr. Vladimíra Clementisa 10  
Bratislava, 821 02  
Tel.: +421 248 282 701-2  
[info@gopas.sk](mailto:info@gopas.sk)



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# Artificial Intelligence for High School Teachers

## Day 4

- Regression
- Definition of regression, the regression process (data training, prediction validation), data structures
- Linear regression, decision trees for regression, practical examples in ScikitLearn
- Classification
- Definition of classification, the classification process (data training, prediction validation)
- Logistic regression, cross entropy, decision trees for classification, examples in ScikitLearn

## Day 5

- Artificial neural networks
- Perceptron and its relationship to logistic regression, activation functions, loss functions
- Feed forward neural networks, the back propagation algorithm
- Convolutional neural networks, visualization of neural networks
- Basics of Tensorflow and Keras for the neural network implementation
- Practical examples of neural network applications

**GOPAS Praha**  
Kodaňská 1441/46  
101 00 Praha 10  
Tel.: +420 234 064 900-3  
[info@gopas.cz](mailto:info@gopas.cz)

**GOPAS Brno**  
Nové sady 996/25  
602 00 Brno  
Tel.: +420 542 422 111  
[info@gopas.cz](mailto:info@gopas.cz)

**GOPAS Bratislava**  
Dr. Vladimíra Clementisa 10  
Bratislava, 821 02  
Tel.: +421 248 282 701-2  
[info@gopas.sk](mailto:info@gopas.sk)

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