FACILITATE-AI

GUIDELINES FOR FACILITATING THE LEARNING OF ARTIFICIAL INTELLIGENCE
BY SCHOOL STUDENTS OF GRADES 7-12

Guidelines for facilitating the learning of Artificial Intelligence (AI)
by School Students of Grades 7-12
Reference Number: 2021-1-CY01-KA220-SCH-000032567

C1 Training course: **Training on Artificial Intelligence (AI) content for adapting to school curricula**

Result 1 - A1/T1
Module Number and Area/Topic: Module 2 - AI in our Life
Module owners: BG-IvanApostolov

Introduction and Broad Description of the Context and Goal of the area/topic addressed

Global adoption of AI technologies in education is transforming the way we teach and learn. Artificial Intelligence is one of the disruptive techniques to customize the experience of different learning groups - students and teachers. The module "AI in our life… (understand)" is encompassing training units focusing on teachers' understanding of what is AI and in what way it could be implemented in our life.

Learning objectives and **learning outcomes** *(from the short description: Competences List of the Training Modules)*

The four learning objectives and learning outcomes are described in the following parts of this module and they are:
PART 1 Industrial Revolution 5.0. What is artificial intelligence (AI)?
PART 2 AI related, areas of knowledge
PART 3 Application of AI (Mashin Learning/Data science)
PART 4 What is an AI algorithm?

Competences *(from the AI Competence Framework)*
1. Knowledge of the foundations of communication as applied to Cloud Education Environments (CEE)
2. Ability for communication in CEE.
3. Ability to establish a shared vision on AI in the educational organization
4. Capacity to build and consolidate communities of interest related to CEE about AI in everyday life.
5. Knowledge of the foundations of creativity as applied to AI
6. Ability to lead cloud education innovations in parallel to the AI projects.

Instruments/Tools/Supporting Material/Resources to be used:
1. Artificial intelligence and the future of life sciences, Michel L.LeiteabLorena S.de Loiola CostaaVictor A.CunhaaVictorKreniskicMariode Oliveira Braga FilhocNicolau B.da CunhaaFabricio F.Costaacdefg, 2021
2. The 10 Best Examples Of How AI Is Already Used In Our Everyday Life, Bernard Marr, Forbes, 2019
3. How AI Will Impact The Future Of Work And Life, Ashley Stahl, Forbes, 2021
4. The role of Artificial Intelligence in future technology, Amr Kayid, Massachusetts Institute of Technology, 2020

5. Applications of AI in Education, by Joseph Beck, Mia Stern, and Erik Haugsjaa,
6. Intelligence Unleashed: An argument for AI in Education, Rose LuckinWayne HolmesUCL Knowledge Lab, University College London Mark Griffiths Laurie B. Forcier, Pearson, 2016
7. Deep learning goes to school: toward a relational understanding of AI in education, Carlo Perrotta & Neil Selwyn, Learning, Media and Technology, 2020
8. The Culture of AI, Everyday Life and the Digital Revolution, Anthony Elliott, 2018
9. AI Its nature and Future, Oxford University Press, 2016
10. https://online.york.ac.uk/artificial-intelligence-and-its-impact-on-everyday-life/
11. https://itchronicles.com/artificial-intelligence/how-do-we-use-ai-in-everyday-life/
12. https://www.analyticssteps.com/blogs/how-has-artificial-intelligence-changed-our-daily-lives
13. https://www.educba.com/what-is-artificial-intelligence/?source=leftnav
14. https://towardsdatascience.com/advantages-and-disadvantages-of-artificial-intelligence-182a5ef6588c
15. https://www.stateofai2019.com/chapter-2-why-is-ai-important/
16. https://blog.socioon.com/role-of-artificial-intelligence-in-our-daily-life/

PART 1	Industrial Revolution 5.0. What is artificial intelligence (AI)?
Learning Objectives	To understand what is artificial inteligence and what are the basic fundaments of the Industrial Revolution 5.0: - What is AI? History of AI - Algorithms of AI - Transference of Consciousness –digital prototype of the human brain - Machine Intelligence –brain neural functions (neural network training) - Bioinformatics – tools To increase cognitive Abilities of the human brain - Brain – computer Interfaces (augmented reality)
Learning Outcomes	To understand that although artificial intelligence is usually associated with computer science, in reality psychologists, biologists, philosophers, mathematicians, linguists, etc. are also involved in the research process.
Competences	- Browsing, searching and filtering data, information and digital content - Digital competence
Activities	- Alexa/Waze/Connected bulevard/… - Autonomous cars - Content recommendation - Action recognition - Transference of consciousness - Machine intelligence - Bioinformatics - Brain – computer Interfaces (augmented reality)

PART 2	AI related, areas of knowledge
Learning Objectives	To learn to what extent can AI be created and to what extent does it exist a priori? Is it necessary to create an intelligent computer program in the image and likeness of the human mind, or is only a strict "engineering" approach sufficient? These and similar questions have not yet been answered, but they support the formulation of tasks and the methodology of modern artificial intelligence. AI is pushing the boundaries of computer science.

| | Usually, the implementation of "intellectual" systems is approached precisely according to the model of human intelligence. In this way, two main directions are distinguished:

symbolic (semiotic, descending) based on modeled "higher" thought processes in man;

neuro-cybernetic (neuronal, biological, ascending) based on modeled "low" structures of the human brain, neurons. |
|---|---|
| **Learning Outcomes** | To understand that the subject of artificial intelligence is the creation of intelligent thinking systems (machines, robots, creatures), with the aim of: studying and modeling human intelligence; automation of functions and solutions of tasks requiring intelligence. |
| **Competences** | - Representation and Reasoning
- Collaborating Around Computing
- Negotiation skills (social and political interactions), and decision making in cloud. |
| **Activities** | - Machine learning/Rule-based Machin Learning
- Deep Learning
- Data science
- Cognitive Computing
- Computer Vision
- NLP (Naturel Language Processing)
- Chabot
- IoT
- Advanced Algorithms
- APIs (Application Process Implications) |

PART 3	**Application of AI** (Mashin Learning/Data science)
Learning Objectives	The following functions are the basic characteristic of the the learning objectives:

- obtaining, presenting and storing knowledge;

- generation and acquisition of behaviors;

- development and use of motives, emotions and priorities;

- processing sensory signals into symbols and using them for logical reasoning about the past and planning the future;

- imagination, supposition, hope, fear. |
| **Learning Outcomes** | To understand that Artificial intelligence is the science and technology of creating intelligent machines, and specifically intelligent computer programs. It also includes the use of computers to study human intelligence in many areas of life and human activity. |

Competences	
	- Knowledge of the foundations of AI as applied to Cloud - Ability for communication in CEE. - Ability to establish a shared vision - Capacity to build and consolidate communities of interest - Negotiation skills (social and political interactions), and decision making in cloud.
Activities	ANI - AI in the narrow sense - Google Search - Alexa/Siri - Bots - Retail and Services - Transport and Logistics - Automotive and Assembly - Agriculture and Industry - Basic materials - Advanced electronics and Semiconductors - Healthcare systems and Services - High Tech - Telecom - Oil & Gas - Labour market AGI - AI in the broadest sense - General Intelligence - Highly intelligent AI machines - Deep machine learning or Neural networks - Knowledge graphs - GAN - synthesizing stroke images

PART 4	What is an AI algorithm?
Learning Objectives	1. To understand how to use the computer for theorem proving, pattern recognition, learning, and other forms of reasoning; 2. Attention to problems for which there are no algorithmic solutions, which means that heuristic search is a fundamental method for solving tasks in AI; 3. Making a decision based on inaccurate, insufficient or ill-defined information and applying methods that support their adequate modelling in the systems and extracting significant qualitative features from the situation; 4. To understand the attempt to solve the problems of semantic meaning as well as syntactic form; 5. To find answers that should not be considered accurate or optimal, but which are in some sense "good enough" as a result of applying the heuristic methods.; 6. To use a large amount of specific knowledge in decision-making, which is the basis for the EU and meta-level knowledge to better manage

	strategy in decision-making is a complex problem for modern systems and an important area of research.
Learning Outcomes	The ultimate goals of AI projects is to get computer programs to solve problems and achieve goals in the world around them as successfully as humans. - Knowledge on the effective decision making, risk management and ethics - Knowledge on legal issues related to safety, data protection, privacy - Ability to solve complex problems - Disposition to Identifying and removing barriers - Disposition to motivating, encouraging, trusting and valuing people - Disposition to social and global awareness and responsibility in relation - Disposition to promote and build an efficient decision making, risk management and ethical digital identity in cloud
Competences	- Problem solving
Activities	- Rule-based Algorithm - Self-learning Algorithm - Model/Parameters/Algorithm Learning - Training Data Set for Algorithm Learning - Test Data Set for Algorithm Learning - Supervised and Unsupervised Learning - Simulations (Monte Carlo) - AI projects - Machine learning projects - An AI project based on the use of data - An AI project based on data science - AI project in sales and manufacturing - AI project in business - AI project for optimization of internal and external communication