Course outline

Artificial Intelligence and Education

(1) GENERAL

SCHOOL	School of Humanities		
ACADEMIC UNIT	Department of Primary Education		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	EG0056	SEMESTER	Fall
COURSE TITLE	Artificial Intelligence and Education		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	WEEKLY TEACHING HOURS	CREDITS
	3	4
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	special background, skills development, lab, elective
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek/English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The course's aim is to give students insights and perspectives into the following:

In terms of knowledge

- Knowledge related to the fundamental principles of Artificial Intelligence (AI), with emphasis on the concepts of Machine Learning, Deep Learning and Neural Networks.
- Knowledge related to Large Language Models and their connection to Natural Language Processing.
- Familiarity with the different categories of AI such as Narrow AI, Artificial General Intelligence and Artificial Superintelligence (ASI).
- Knowledge related to how AI-based content production tools work, such as image, video, and music creation tools from text.

- Knowledge related to the basic ethical and social issues related to the application of AI in the educational process.
- Understanding of the role of AI in education, such as personalizing teaching, enhancing access to quality education and supporting students with special needs.
- Understanding of the impact of AI on educational assessment, but also on the role and responsibilities of the teacher.

In terms of skills

- Development of skills related to the use of prompting techniques to create accurate and productive interactions with AI tools.
- Development of the ability to apply AI tools to produce lesson plans, exercises, activities and custom tests.
- Development of skills related to the use of AI tools for creating educational materials, such as images, videos and music, that support teaching.
- Development of skills related to the integration of AI into teaching practices, aiming to improve students' experience in the classroom.
- Development of the ability to use AI tools to analyse and diagnose learning difficulties and knowledge gaps.
- Cultivation of the ability to use AI tools to provide effective and automated feedback to students.

At competence level

- Ability to critically assess the reliability, usefulness, and ethics of AI tools in the educational context.
- Cultivation of a mindset for the adaptation and acceptance of AI tools in the educational process, enhancing the trust of both teachers and students in these technologies.
- Ability to design and implement educational approaches that integrate AI tools in an ethical, pedagogical, and productive way.
- Strengthening the capacity to assess the impact of AI tools on teachers' role and readiness to manage changes in the educational process.
- Ability to address challenges related to students' use of AI tools in assignments or exercises, adopting creative and fair solutions.
- Enhancing adaptability to integrate AI tools for students with diverse and multifaceted learning needs.
- Development of a vision for the educational use of AI tools as means of reducing inequalities by enhancing access to quality education for vulnerable communities.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Others…
…….

The course aims at the following general competences:

- Adapting to new situations.
- Decision-making.
- Working independently.
- Team work.

- Working in an interdisciplinary environment.
- Production of new research ideas.

(3) SYLLABUS

The integration of this course into the curriculum of a pedagogical department is of significant importance, as it addresses the modern challenges and opportunities presented by the rapid advancement of AI and its application in the field of education. In an era when technological innovation and digital culture are profoundly shaping the present and future of pedagogy, a deep understanding of the possibilities, perspectives, and ethical and societal implications of AI is imperative for every educator.

This course pursues a dual purpose. Primarily, it seeks to equip students with a comprehensive understanding of AI's educational applications, encompassing both theoretical foundations and practical implementations. Additionally, it encourages aspiring educators to engage in reflective and critical thinking about AI's influence on the educational process and the broader educational system. This objective is pivotal in cultivating educators who are not only technologically adept but also socially responsible and ethically conscientious.

Through this course, students will gain essential knowledge of fundamental AI principles, including Machine Learning, Neural Networks, Natural Language Processing, and Large Language Models. This technical grounding serves as a basis for recognizing the transformative potential of AI in reshaping interactions between teachers and students. Furthermore, the course investigates practical AI applications in education, tackling topics such as personalized learning, the identification of learning disabilities, and support for students with special needs. By engaging with real-world examples and case studies, students will develop an appreciation for the ways AI tools, such as chatbots, automated feedback and assessment platforms, and personalized exercise creation systems, contribute to enhancing the efficiency and effectiveness of educational practices.

A critical component of the course is the examination of the social and ethical dimensions surrounding AI applications in education. It delves into issues such as data privacy concerns, algorithmic biases, the potential dehumanization of learning processes due to over-reliance on technology, and the risks of losing meaningful human interaction in education. This analytical approach is aimed at preparing future educators who not only understand how to integrate AI in the classroom but can also navigate and address the challenges and risks associated with its adoption.

A key pillar of the course is its emphasis on preparing educators for their evolving roles in the age of AI. By developing familiarity with advanced prompting techniques and tools capable of generating images, videos, music, and even deepfake simulations for educational purposes, future teachers will be empowered to harness AI creatively. Such skills enable them to design differentiated, interactive, and innovative learning experiences, tailored to meet diverse student needs. To reinforce these competencies, the course provides hands-on activities and application scenarios where students can practice using these tools. Additionally, it offers clear guidelines on creating lesson plans, exercises, and multimodal activities that leverage AI technologies effectively. Importantly, the course also instills a strong foundation of ethical awareness, ensuring future educators are equipped to apply these tools responsibly and align their use with the goals and values of education.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face using PCs and/or laptops
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	ICTs are the course's subject
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	

Activity	***Semester workload***
Lectures	35
Lab exercises/activities	35
Independent study	30
Preparation of short written assignments	20
Course total	***120***

STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	The evaluation includes the following components: 1. Laboratory exercises during the semester. 2. Short written assignments. 3. Final written exam. The successful completion of all the aforementioned activities is a prerequisite for the awarding of the academic credits.

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Lecture notes, tutorials and scientific articles uploaded to the Department's LMS.

- Related academic journals:

Computers & Education
Computers & Education: Artificial Intelligence
Education and Information Technologies
Technology, Knowledge, and Learning