COMILLAS
UNIVERSIDAD PONTIFICIA
CIHS

COURSE SYLLABUS

Course: **MIND AND ARTIFICIAL INTELLIGENCE**

COURSE DATA	
Degree	Diploma in Humanities and Global Challenges
Academic Year	2023-24
Credits	6
Course type	Elective
Department	Psychology
Language of instruction	English

SHORT DESCRIPTION

At the end of the course the student will be able to:

- Clearly recognize the essential elements of artificial intelligence in the activities of daily life using a language specific to the field of artificial intelligence.
- Learn to think critically about the difference between mind, brain and artificial intelligence.
- Understand how the brain is believed to work on the cellular, network and systems level.
- Learn about cognitive phenomena related to brain activity.
- Justifiably identify how artificial intelligence can help humanity to understand the world, to understand the human condition, to improve the current world, to solve problems, to create new occupations, and to improve human capabilities.
- Evaluate the prospective role of artificial intelligence in different domains of people's lives (family, school, health, sports...) and estimate its usefulness in people's daily activities.
- Reflect on the limits, ethics and future of AI.

CONTENTS AND STRUCTURE

TOPIC 1: INTRODUCTION TO MIND AND ARTIFICIAL INTELIGENCE

TOPIC 2: COGNITIVE SCIENCE AND AI

TOPIC 3: NEUROSCIENCE AND AI

TOPIC 4: ARTIFICIAL INTELLIGENCE

TOPIC 5: PROBLEM SOLVING, KNOWLEDGE REPRESENTATION AND MACHINE REASONING

TOPIC 6: MACHINE LEARNING, DEEP LEARNING AND NEURAL NETWORKS

TOPIC 7: LANGUAGE, SPEAKING AND TRANSLATION APPLICATIONS TO AI

TOPIC 8: INTELLIGENT AGENTS AND ROBOTS

TOPIC 9: SOCIAL LIFE AND AI

TOPIC 10: PRESENT AND FUTURE APPLICATIONS OF AI

METHODOLOGY

The course focuses on a classroom-based methodology with mandatory attendance. Students are required to attend the lectures and actively participate in class activities, such as problem-solving exercises, interactive lectures, discussions, and group assignments. There are two exams: The midterm exam serves as a progress assessment, and successfully passing it eliminates the corresponding topics from the final exam. To prepare for both exams, students are expected to study and review the course material at home. Additionally, as part of the assessment, students deliver and present a project work in class, based on one of the proposed topics, showcasing their research and analysis skills. Only students who meet the attendance requirements are eligible to participate in the midterm and final exams, as well as in the project work presentation. This methodology emphasizes face-to-face learning, active engagement in class, and independent study outside the classroom, allowing students to show their understanding and application of the course content.

ASSESSMENT AND GRADING

Assessment type	Assessment criteria	Percentage
EXAMS	Pass the exam with a 5 out of 10	50%
GROUP PRESENTATION	Deliver and present in class a project work about one of the topics proposed in class	30%
COURSEWORK	Upload in Moodle the exercises carried out in class	20%

- Committing any serious academic misconduct, such as **plagiarism** of previously published material, or **copying** in the exam or any other graded activity, **will imply not being able to pass the course in the ordinary assessment period.**

- At the beginning of the term the professor will announce the office hours for the course. Tutorials are an essential part of the development of the course, and students may attend tutorials during the course within those office times, but it is recommended that they are arranged in advance with the professor.

- Any non-face-to-face learning activity that requires the submission of an assignment/document, etc. will be submitted by the student through Moodle, always in PDF format.

- To be able to take the final exam, students must not have missed **more than one third of the classes without justification**. If this requirement is not met, the student may lose the right to be assessed both in the ordinary and extraordinary assessment period (art. 93-1 of the General Regulations). Failure to attend to the first hour of a two-hour lecture, means having missed the whole session in terms of attendance, regardless of whether or not the student the second hour.

STUDENT WORKLOAD (in hours)		
CONTACT HOURS	OUTSIDE CLASSROOM	OVERALL
60	90	150

READING LIST / RELEVANT REFERENCES
Bechtel, W. (1998). Philosophy of Mind: An Overview for Cognitive Science. Hillsdale, N.J.; Hove: L. Erlbaum Associates.
Boden M. (ed.) (1990). The Philosophy of Artificial Intelligence. Oxford: Oxford University Press.
Boden M. (2008). Mind as Machine: A History of Cognitive Science. Oxford: Clarendon.
Carter, M. (2007). Minds and Computers: An Introduction to the Philosophy of Artificial Intelligence (1st ed.). Edinburgh: Edinburgh University Press.
Hopgood, A. A. (2021). Intelligent systems for engineers and scientists: a practical guide to artificial intelligence. CRC press.
Lee, R.S.T. (2020) Artificial Intelligence in Daily Life; Springer: Singapore.
Livingston, S. & Risse, M. (2019). The future impact of artificial intelligence on humans and human rights. Ethics & international affairs, 33, 2, 141–158.
Mitchell, M. (2019). Artificial intelligence: A guide for thinking humans. Penguin UK.
Perconti, P., & Plebe, A. (2020). Deep learning and cognitive science. Cognition, 203, 104365.
Russell, S. J., Norvig, P., Canny, J. F., Malik, J. M., & Edwards, D. D. (2003). Artificial intelligence: a modern approach. Prentice Hall Upper Saddle River.
Thagard, P. (2007). Philosophy of psychology and cognitive science (handbook of the philosophy of science). North Holland.
OTHER RESOURCES
https://www.humanbrainproject.eu/en/