

Minds, Machines and Cognition

Code: 43842
ECTS Credits: 6

Degree	Type	Year	Semester
4316227 Applied Philosophy	OT	0	2

Contact

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Use of languages

Principal working language: catalan (cat)

Teachers

Targeta Provisional

Prerequisites

Competent english reading.

Objectives and Contextualisation

Can a machine be creative? Can a machine think, have emotions? Artificial intelligence is present in our everyday life, in science, in art, and unfortunately, also in war. This course is an introduction to Philosophy of Artificial intelligence, we will deal with its ethical limits, the possibilities of designing a general artificial intelligence, and we will study cognitive architectures.

Cognitive science is the current science of mind. It is a clearly interdisciplinary discipline in which research into philosophy, computer science, linguistics, psychology, neuroscience, sociology and anthropology converge.

In cognitive science, models have been proposed on a wide variety of cognitive processes and explanations have been offered on language, vision / perception, memory, concepts, reasoning, problem solving and decision. One of the distinguishing features of the first works in cognitive science was the assumption that the mind could be understood as a computer of a special type.

In the module, some of the main works in the philosophy of cognitive science and artificial intelligence will be studied and the influence of computer analogy in cognitive science will be analyzed through a philosophical and critical approach. Different logics will also be introduced to represent knowledge in artificial intelligence (modal, temporal, deontic, fuzzy...)

Skills

- Analyze critically and synthesize information obtained from an article or a specialized monograph, and from quality information distributed on the web.
- Apply knowledge of classical authors in the western philosophical tradition to current philosophical questions.
- Continue the learning process, to a large extent autonomously.

- Critically assess the implications on the human condition of new ideological, political, economic and technological forms that impact on the contemporary world.
- Define, design, plan and prepare an original and unpublished work of philosophical research, following established academic-scientific parameters.
- Establish and apply the implications that scientific knowledge and research have for advanced philosophical research.
- Organize ones own time and resources to undertake research: design a plan by prioritizing objectives, schedules and commitments.
- Reconstruct and analyze critically the positions of the main current researchers in the field of philosophy of each of the main subject areas of the masters degree (science, art, politics) using their characteristic categories and lexis.
- Relate the concepts and knowledge of the various areas of current philosophical research in relation to dependencies between science and technology, and the ethical and political implications of such dependencies.
- Search for, select and manage information autonomously, both from structured sources (data bases, bibliographies, specialized journals) and from information distributed on the web.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.

Learning outcomes

1. Analyze critically and synthesize information obtained from an article or a specialized monograph, and from quality information distributed on the web.
2. Apply and adapt current philosophical proposals to problems in the cognitive sciences.
3. Apply current philosophical language, content and theories to the problems related to philosophy of the mind.
4. Apply knowledge of philosophy to debates on the regulation of cybernetics.
5. Continue the learning process, to a large extent autonomously.
6. Demonstrate critical understanding of some explanations concerning the mind and the cognitive sciences and the technical applications of these.
7. Draw up a paper in philosophy within the framework of problem areas in the cognitive sciences.
8. Organize ones own time and resources to undertake research: design a plan by prioritizing objectives, schedules and commitments.
9. Relate scientific knowledge to philosophical proposals and their explanatory and critical orientations.
10. Search for, select and manage information autonomously, both from structured sources (data bases, bibliographies, specialized journals) and from information distributed on the web.
11. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
12. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.

Content

1. Introduction to Artificial Intelligence. Turing machines and the problem of consciousness.
2. Artificial intelligence and cognitive sciences.
3. Knowledge Representation and reasoning. Non-classical logics (modal, epistemic, deontic, fuzzy).
4. Machines, language and creativity.
5. Ethics and social robotics.

Methodology

There are three elements:

1. Lectures.
2. Seminars: discussions of the required readings.
3. Student's work at home. Students must do some required readings. The work will be supervised by the teachers during seminars.

Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed			
Seminars and lectures.	30	1.2	3, 4, 2, 6, 7, 11, 5, 9, 12
Type: Supervised			
Tutorials.	26	1.04	1, 10, 9
Type: Autonomous			
Compulsory and required readings.	61	2.44	1, 10, 8
Doing exercises.	7	0.28	1, 8, 5
Preparing oral presentation.	7	0.28	1, 3, 4, 2, 10, 6, 7, 8, 5, 9

Evaluation

The evaluation is considered continuously, and with three evaluation activities. In the seminar, different articles

The other two activities will be exercises of logic, that will have to be presented fifteen days after its delivery by the

The re-evaluation will be carried out on the date officially fixed for the final exam for those people who have not re

Those people who have not performed the three activities and have not been submitted to the re-evaluation will be

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Argumentative Essay	50%	11	0.44	1, 3, 4, 2, 10, 6, 7, 8, 11, 5, 9, 12
Exercises.	50%	8	0.32	11, 5

Bibliography

1. David Barker-Plummer, *Turing Machines*, *The Stanford Encyclopedia of Philosophy* (Winter 2016 Edition), Edward N. Zalta (ed.) <https://plato.stanford.edu/archives/win2016/entries/turing-machine>
2. Johan van Benthem, *Modal Logic for Open Minds*, Center for the Study of Language and Information, 2000.
3. Johan van Benthem, Hans van Ditmarsch, Jan van Eijck, Jan Jaspars, *Logic in Action*, Center for the Study of Language and Information, 2016.
4. Margaret A. Boden, *AI: Its nature and future*, Oxford University Press, 2016
5. Jack Copeland, *Artificial Intelligence: A Philosophical Introduction*, Wiley-Blackwell, 1993.
6. Pedro Messeguer, Ramón López de Mantaras, *Inteligencia Artificial*, Editorial CSIC, 2017.
7. Nick Smith, *Vagueness and degrees of truth*, Oxford University Press, 2013.
8. Stuart Russell, Peter Norvig, *Artificial Intelligence: A Modern Approach*, 3rd edition, Prentice Hall Press (2009)
9. Carme Torras, *The Vestigial Heart*, MIT Press, 2018.
10. Alan Turing, *Computing Machinery and Intelligence*, *Mind*, Issue 236, pp. 433-460, 1950..