UNIVERSITÀ DI PISA

FILOSOFIA E NEUROSCIENZE

MARIO PIRCHIO

Anno accademico	2023/24
CdS	PHILOSOPHY AND FORMS OF KNOWLEDGE
Codice	694MM
CFU	12

Moduli	Settore/i	Tipo	Ore	Docente/i
FILOSOFIA E NEUROSCIENZE	M-FIL/02	LEZIONI	72	MARIO PIRCHIO

Learning outcomes

Knowledge

The following knowledge will be provided.
1) How contemporary philosophy on the one hand and neuroscience on the other are tackling the study of some **themes of philosophy of mind**, including perceptions, hallucinations, imagination, attention, perception of time, consciousness and free will.
2) How the **brain** works, both at a low level (neurons, synapses) and at a high level (perceptions, attention, object recognition...).
3) How to use the **experimental data** of neuroscience to try to gain **a better understanding** of the mind and **to evaluate** the theories of philosophers of mind.
4) How and to what extent **mental events** can be measured experimentally with neuroscience methods.
5) The student will also carry out psychophysics **experiments** in class and at home to measure some mental events. Two **experimental lessons** are also planned at the Neuroscience Institute of the CNR in Pisa for the measurement of electroencephalographic signals and for psychophysics measurements.

Assessment criteria of knowledge

Final oral exam in which the student must demonstrate knowledge of the topics covered in the course.

Skills

At the end of the course the student:
1) will have a general overview of the **theories of various philosophers of the mind** such as Dennett, Searle, Noë, Varela, Chalmers and others, i.e. philosophers who make extensive use of the experimental results of the neurosciences in proposing their theories;
2) will have acquired knowledge on the **functioning of the brain**, both at a low level (neurons, synapses) and at a high level (perceptions, attention, object recognition...);
3) will be able to critically **analyze the scientific neuroscience literature concerning perceptions**, hallucinations, imagination, attention, time perception, consciousness, free will, phantom limb, blindsight, binocular rivalry, etc.;
4) will have acquired knowledge on various **experimental results of neuroscience useful for** a better understanding of the mind and for evaluating the theories of philosophers of mind;
5) will have carried out psychophysics **experiments** for measuring perceptions and attention, will have analyzed the data obtained, will have constructed the graph and will have carried out the statistical analysis.

Prerequisites

Detailed basic knowledge of biology and neuroscience will be provided at the beginning of the course so that all students can profitably follow the lessons.
During the course, all the knowledge necessary for the experimental part (graph and statistical analysis) will also be provided.

Teaching methods

The course takes place through **lectures with the aid of slides and original articles**. Psychophysics **experiments** are foreseen, with relative data acquisition and statistical analysis, which students will carry out personally in class and at home. Students will also be able to do **a seminar** on a chapter/article referred to in points 4-49 of the bibliography.
The teacher also points out that he is AVAILABLE for any ADDITIONAL EXPLANATION regarding the topics of the course and the exam. The student who has misunderstood a topic, wants an explanation on a slide, etc. etc., you can call the teacher (050 531997 or 346 667 4704) every day, including public holidays, until 11.00 pm.
Reception is also scheduled during the course (time to be determined).

Syllabus

1) We will talk about the **mind-body problem** and **dualism, materialism, functionalism**... We will analyze the position of philosophers, such as Dennett, Searle, Noë, Varela, Chalmers and others, who use/discuss extensively experimental results of the neurosciences concerning phantom limb, blindsight, binocular rivalry, etc.
2) We will talk about **how the brain works**, both at a low level (neurons, synapses) and at a high level (perceptions, attention, object recognition...).
3) We will deal with the reading of **neuroscience articles** in which topics of interest to both philosophers and neuroscientists are experimentally investigated, critically analyzing the results achieved. **We will especially focus on the following topics**: visual perceptions, hallucinations, imagination, time perception, attention, phantom limb, blindsight, binocular rivalry, sleep and dreams, lucid dreaming and sleep paralysis, mirror neurons, neural networks, brain patients divided, ferrets of Sur, Bach-y-Rita, emotions, language, free will.
4) We will use the knowledge acquired with the previous two points to evaluate whether and how much the theories of philosophers of mind such as Dennett, Searle, Noë, Varela, Chalmers and others **are in agreement** with the experimental data of the neurosciences.
5) We will carry out some neuroscience (psychophysics) **experiments** in class with the aim of measuring mental events related to perceptions, attention, emotions and language, with related data acquisition, graph construction and statistical analysis. The students will replicate these experiments at home, ie in experimentally more suitable conditions. Two **experimental lessons** are also planned at the Neuroscience Institute of the CNR in Pisa for the measurement of electroencephalographic signals and for psychophysics measurements.
Many lessons concerning the philosophical part will be held **in the presence of other professors** of the department (prof. Gronda, prof. Turbanti, prof. Manca).
Some lessons will be held by the following teachers.
Prof. Iacono (Unipi): The perception of reality in William James and Alfred Schütz.
Prof. Gronda (Unipi): Philosophy of the experiment.
Prof. Turbanti (Unipi): Mental representations.
Prof. Cicchini (Institute of Neurosciences, CNR, Pisa): Perception of time.

Bibliography

The **slides** and **articles** used in class can be downloaded from the e-learnig platform.
Bibliography (philosophical part)
Philosophy texts
The following chapters must be taken to the exam (see also Examination methods).
1) S. Nannini - Soul and body. A historical introduction to the philosophy of mind. Laterza Publishers, 2021. Only pages. VII-XXVII and pp. 150-232.
2) A. Paternoster - Introduction to the philosophy of mind. Publishers Laterza, 2010. Only the chap. 1, 5, 8 and pp. 207-225.
3) J.R. Searle - The mind. Raffaello Cortina Editore, 2005. Only the chapters. 2 and 10. **Philosophy chapters and articles**
Five of the following chapters/articles of your choice must be taken to the exam (see also Examination methods). They will be downloadable from the e-learnig platform.
Consciousness and perceptions
4) Baars BJ - 2005 - Global workspace theory of consciousness - toward a cognitive neuroscience of human experience, Prog. Brain Res., 150, 45-53.
5) Block N - 1996 - How can we find the neural correlate of consciousness?, Trends Neurosci., 19, 456-459.
6) Chalmers D - 2000 - What is a Neural Correlate of Consciousness?, MIT Press.
7) Chalmers D - 2003 - Consciousness and its place in nature, pp. 102-108 and 119-142, The Blackwell Guide to Philosophy of Mind.
8) Churchland PM - 1981 - Eliminative Materialism and the Propositional Attitudes, Journal of Philosophy, 78, 67-90.
9) Damasio - 1998 - Investigating the biology of consciousness, Phil.Trans. R. Soc. London. B, 353, 1879-1882
10) Damasio - 2009 - Consciousness - An Overview of the Phenomenon and of Its Possible Neural Basis, in The Neurology of Consciousness (chap. 1).
11) Davidson D - 1970 - Mental Events, in Actions and Events (pp. 170-185), Oxford, Clarendon Press, 1980.
12) Dennett DC - 1991 - Consciousness. What is it. Editori Laterza, 2009. One chapter chosen from the following: 5, 6, 12, 13, 14.
13) Dennett DC - 1997 - The myth of double transduction, MIT Press.
14) Dennett DC - 2011 - Consciousness cannot be separated from function, Trends Cogn. Sci., 15, 358-364.
15) Dennett DC - 2016 - What is the Bandwidth of Perceptual Experience, Trends Cogn. Sci., 20, 324-355.
16) Dennett DC - 2017 - From drums to Bach. How the mind evolves. Raffaello Cortina Editore, 2018. The chap. 4 and 5 or chap. 14.
17) Dennett DC - 2018 - Facing up to the hard question of consciousness, Phil.Trans. R. Soc. B, 373: 2017.0342.
18) de Vignemont - 2020 - Bodily Awareness, in The Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.).
19) Doerig, Schurger, Herzog - 2021 - Hard criteria for empirical theories of consciousness, Cognitive Neuroscience, 12:2, 41-62.
20) Nagel T - 1974 - What Is It Like to Be a Bat?, Philosophical Review, 83, 435-450.
21) Noë A - 2000 - Noë Pessoa and Thompson - Beyond the Grand Illusion, Visual Cognition, 7, 93-106.
22) Noë A - 2002 - O'Regan and Noë - Is the Visual World a Grand Illusion?, J. Conscious. Stud., 9, 1-12.
23) Noë A - 2003 - Hurley and Noë - Neural Plasticity and Consciousness, Biology and Philosophy, 18, 131-158.
24) Noë A. - 2004 - Noë and Thompson - Are There Neural Correlates of Consciousness?, J. Conscious. Stud., 11, 3-28.
25) Noë A - 2009 - Because we are not our brain. A radical theory of consciousness. Raffaello Cortina Editore, 2010. Only the chap. 3.
26) Northoff - 2017 - How do the brain's time and space mediate consciousness and its different dimensions? Temporo-spatial theory of consciousness (TTC), Neurosci. Biobehav. Rev., 80, 630-645 27) Searle JR - 1997 - The mystery of consciousness. Raffaello Cortina Editore, 1998. One chapter chosen from the following: 2 (Crick), 5 (Dennett), 6 (Chalmers).
28) Searle JR - 2000 - Consciousness, Annu. Rev. Neurosci., 23, 557-578.
29) Searle JR - 2004 - The mind. Raffaello Cortina Editore, 2005. Only the chapters. 4 and 5 (Consciousness).
30) Searle JR - 2007 - Dualism revisited, J Physiol Paris, 101, 169-178.

31) Sellars - 1956 - Empiricism and the philosophy of mind, in H. Feigl and M. Scriven Eds., The foundations of science and the concepts of psychology and psychoanalysis, pp. 253-329.
32) Sellars W - 1981 - Mental events, in The scientific image and the manifest image, Marlettti and Turbanti, cap. 13, ETS Editions, 2013.
33) Varela FJ - 2006 - Neurophenomenology. A methodological remedy for the "hard problem", J. Conscious. student 1996, 3, 330-349.
Time perception
34) James W - 1890 - The perception of time, in Principles of psychology, cap. XV.
35) Bergson H - 1908 - The memory of the present and the false recognition, Revue philosophique. To be taken together with: Bodei R - 2006 - The memory of the present, chapter V in Pyramids of time, Stories and theory of déjà vu, il Mulino.
36) Gallagher and Zahavi - 2008 - Time, chapter 4 in The phenomenological mind. Philosophy of mind and cognitive sciences, Cortina Raffaello.
37) Thompson E - 2007 - Temporality and the living present, cap 11 in Mind in Life, Harvard University Press.
38) Varela F - 1999 - The specious present: a neurophenomenology of time consciousness, cap 9 in Naturalizing Phenomenology, Stanford University Press.
Hallucinations
39) 1997 - Martin - The reality of appearances - 2009 - pp 91-115.
40) 2013 - Macpherson and Platchias - Hallucination - Phylosophy and Psychology - Only the ch. 1. 41) 2016 - Nanay - Hallucination as Mental Imagery
Imagination
42) 2015 - Hutto - Overly Enactive Imagination? Radically Re-Imagining Imagining.
43) 2020 - Nanay - Unconscious mental imagery.
44) 2022 - Ferrarin - A world not of this world - chap 2.
45) 2022 - Ferrarin - A world not of this world - chap 4.
Free will
46) De Caro M - 2011 - Free will. An introduction. Publishers Laterza, 2011. Only the Introduction.
47) De Caro M - 2012 - Free will is not an illusion, in From the philosophy of action to the philosophy of the mind, Corisco Edizioni, 2018. Only pp. 85-94.
48) Dennett DC - 2003 - The evolution of freedom. Raffaello Cortina Editore, 2004. Only the chap. 8. 49) Searle JR - 2004 - The mind. Raffaello Cortina Editore, 2005. Only the chap. 8.

Bibliography (Neuroscience part)
Neuroscience textbooks
For consultation only. **Not required** for the exam.
A) Kandel, Schwartz, etc. Principles of neuroscience. Ambrosian Publishing House - Zanichelli. Fourth edition. Single volume.
B) Gazzaniga, Ivry, Mangun. Cognitive neuroscience. Publisher: Zanichelli. Second Italian edition.
C) Watson, Breedlove. The brain and the mind. The biological basis of behavior. Publisher: Zanichelli. D) Purves, Cabeza, Huettel, LaBar, Platt, Wolforff. Cognitive neuroscience. Publisher: Zanichelli. Second Italian edition.
Neuroscience articles
Five articles chosen from among those presented/analysed during the course must be brought to the exam, and which can be downloaded from the e-learnig platform (see Examination methods).

Non-attending students info
It is highly recommended to attend the lessons, especially for the experimental part.
The exam program is the same for attending and non-attending students. However, non-attending students will have to contact the teacher by **phone** ((050 531997 or 346 667 4704) or **whatsapp** (346 667 4704) or **email** (mario.pirchio@sns.it) to get the multimedia material.

Assessment methods
Final **oral** exam.
1. **Philosophy**
Students will have to bring the chapters of the introductory texts to the exam as specified in **points 1, 2 and 3** of the bibliography. Furthermore, those who have attended the seminar will have to bring to the examination **2** of the chapters/articles listed in **points 4-49** of the bibliography, at their choice, obviously excluding the philosophers related to the seminars, and discuss them. On the other hand, those who have not attended the seminar will have to take **5** of the aforementioned chapters/articles for examination, at their choice; of these 5 they will have to discuss **3**, of which 1 chosen by the student himself and 2 by the commission.
2. **Neuroscience**
The neuroscience articles presented/analysed during the course will be downloadable from the e-learnig platform. Students will have to bring to the exam **5** of these **articles**, of their choice, of which however at least one on **imaging**, at least one on **microelectrode**, at least one on **EEG or evoked potentials**, and at least one on **electrical stimulation**. Of these 5 they will have to illustrate 2, of which one chosen by the student himself and one by the commission, showing that they know how to describe the **figures**, the **aims** of the experiment, the **experimental procedure** and the main **result**, and showing that they know how to analyze any errors in interpretation made both by the authors of the experiment and by philosophers who discuss such experiments. The papers relating to Owen (1a...1e) must be brought together and count as one article. The papers relating to Koubeissi and Bickel (1a and 1b) must be taken together and count as one article.
3. **Experiment**
The student will have to illustrate an experiment chosen by the commission among those carried out during the course (Donders, Posner), build the **graph** of the relative **experimental data provided at the time of the exam** and carry out the **statistical analysis**.
To prepare for the exam it is important to have the **slides** and **articles** used in class and which can be downloaded from Moodle. If during the preparation you have doubts, questions, etc. etc., **call me immediately** (050 53 1997 or 346 66 74 704). I am available every day, holidays INCLUDING, until 11pm. Even the **prof. Gronda**, the **prof. Turbanti** and the **prof. Manca** made themselves available to resolve doubts, answer

questions, etc. You can send them an email message (roberto.gronda@unipi.it or giacomo.turbanti@unipi.it or danilo.manca@unipi.it) to agree on a time.

Class web page

https://elearning22.humnet.unipi.it/enrol/index.php?id=1012

Additional web pages

None.

Notes

The course starts on Tuesday 20 February, 5.45pm, Pao E1 room (Palazzo Carità, first floor).
ORARIO
Tuesday **5.45pm-7.15pm - Pao E1 room** (Palazzo Carità, first floor).)
Wednesday 4.00pm-7.15pm - Pao E1 room (Palazzo Carità, first floor).)
For more information about the course or exam, for explanations, etc., students can contact the teacher preferably by **phone** (050-531997 or 346 667 4704 every day, holidays INCLUDED, till 23:00) or **whatsapp** (346 667 4704), or even by **email** (mario.pirchio@sns.it).
Exam commission: Mario Pirchio (president), Roberto Gronda, Giacomo Turbanti.
Alternate commission: Danilo Manca (president), Pierluigi Barrotta, Giovanni Paoletti, Yamina Venuta.

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