# Syllabus

## Philosophy of Cognitive Science, Spring 2022

### Course coordinator and contact

Lecturer
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### Other people

Instructor
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Lecturer
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Guest Lecturer
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Guest Lecturer
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### Purpose of the course

**From the study regulations**: *The purpose of the course is to provide students with the knowledge and competences required to develop an understanding of cognitive science in its broader historical, philosophical, and social contexts.*

*The course focuses on general topics in the philosophy of science, the history of cognitive science, and the philosophy of cognitive science. The course also includes material on research ethics and meta-scientific reflection on methods in cognitive science.*

*This course places the conceptual content taught in the Introduction to Cognitive Science, Cognition and Communication, and Applied Cognitive Science courses into their broader historical and philosophical context. The course provides opportunity for critical meta-scientific reflection on the methodological content taught in the Methods courses. The course provides critical knowledge of research ethics necessary for graduating students to apply their knowledge in the workplace.*

### Academic objectives

**From the study regulations**: *In the evaluation of the student's performance, emphasis is placed on the extent to which the student is able to:*

*Knowledge:*

*- demonstrate understanding of the intellectual history of cognitive science*

*- explain the central scientific paradigms guiding cognitive science research.*

*Skills:*

*- discuss ethical research, and/or evaluate existing empirical research relative to international ethical standards*

*- critically evaluate best research practices in cognitive science.*

*Competences:*

*- debate the strengths and weaknesses of scientific paradigms in cognitive science*

*- orally present arguments.*

## Class activities

We will run through a cycle of four activities that will prepare you for the exam and hone your written and oral presentation skills. Each cycle will have a common theme corresponding to the lectures. The idea behind this cycle is that learning to argue and think is facilitated by being able to formulate one's ideas and arguments in writing. The first round of each activity will include a short introduction to the format.

1. Debate contests

Four members per team. First speaker sets the stage and defines the terms. Second speaker makes the argument. Third speaker gives the rebuttal. Fourth member takes notes and supplies the third speaker with these notes.

2. Writing a short paper

Each student writes a short paper on a question or case within the common theme. The question or case is revealed at the beginning of the class, and the paper should be handed in at the end of the class.

3. Peer reviews of papers

Students take turns giving each other detailed feedback on their short papers. The teacher's general feedback is supplied after this round.

4. Mock oral exams

In the first half, students prepare a presentation based on their paper. – in the second half they present to another student and get feedback.

## Examination

**From the study regulations:** *The exam is an individual oral exam including preparation time. The students draws a question which must be prepared for the oral presentation. The oral exam is based on the student's presentation followed by a dialogue between the student and the examiner in which the rest of the course syllabus is included.*

*Preparation time: 30 minutes.*

*Duration: 30 minutes.*

*All aids are permitted.*

*Assessment: 7-point grading scale*

*Grading: Internal co-examination*

Dates: June 13-17

Register for re-exam June 20

Re-exam August 17-18

## Time and place

Lectures: Mondays 12.00 – 14.00 in 1485-226, except Lecture 10 which is Wednesday from 8-00 – 10.00 in 1441-110, and lectures 8, 9, and 11 which are Mondays 16.00 – 18.00 in 1441-110.

Class 2: Tuesdays 15.00 – 17.00 in room 1485-240

Class 1: Thursdays 15.00 – 17.00 in room 1483-454

## Course outline and required readings

**Lecture 1 (week 6)** – Why are we here? Introduction and course aims (Lau Møller Andersen)

Readings:

- (Chapter 1) Dienes, Z., 2008. Understanding Psychology as a Science: An Introduction to Scientific and Statistical Inference. Palgrave Macmillan, Basingstoke. *This is mostly an appetiser to get you thinking.* Book extract made available on Brightspace

**Class 1** – Journal club: Removing doubt, fixating belief. (Tuesday: Aleksander Moeslund Wael; Thursday: Lau Møller Andersen)

Readings:

- Peirce, C.S., 2021. The Fixation of Belief, in: The Fixation of Belief. Princeton University Press, pp. 39–48. https://doi.org/10.1515/9781400831296-007 *One of my personal favourites: discusses four ways that you can remove doubt: the method of* ***tenacity****, the method of* ***authority****, the* ***a priori*** *method and the* ***scientific*** *method.*

Tasks:

- Discuss the article and its merits.
- Discuss real-life examples of people using the four methods.
- Is removing doubt what we mean by knowledge?

### *Part 1 – Philosophy of science*

**Lecture 2 (week 7)** – Is cognitive science a science? (Joshua Skewes)

Readings:

- Hansson, S.O., 2008. Science and Pseudo-Science. https://plato.stanford.edu/entries/pseudo-science/?utm_source=instantmagazine&utm_medium=organic&utm_campaign=OImrt19

- Bem, D.J., 2011. Feeling the future: Experimental evidence for anomalous retroactive influences on cognition and affect. Journal of Personality and Social Psychology 100, 407–425. https://doi.org/10.1037/a0021524
- Open Science Collaboration, 2015. Estimating the reproducibility of psychological science. Science 349. https://doi.org/10.1126/science.aac4716

**Class 2** – Debate contests (Tuesday: Lau Møller Andersen; Thursday: Aleksander Moeslund Wael)

After a short introduction to the procedure, the following two questions will be debated two teams will be contesting, one team arguing *yes* and team arguing *no*.

1. Is precognition research pseudoscience?
2. Is psychological research pseudoscience?

**Lecture 3 (week 8) –** Guest Lecture: Theory in cognitive science (Iris van Rooij)

- Cummins, R., 2000. How does it work? ”versus” what are the laws?”: Two conceptions of psychological explanation, in: Keil, F.C., Wilson, R.A. (Eds.), Explanation and Cognition. MIT Press, pp. 117–144. Link *focus is on this paper...*
- van Rooij, I., Baggio, G., 2021. Theory Before the Test: How to Build High-Verisimilitude Explanatory Theories in Psychological Science. Perspect Psychol Sci 16, 682–697. https://doi.org/10.1177/1745691620970604 *...whereas this paper is more for self-study*

**Class 3** – Essay writing (Tuesday: Aleksander Moeslund Wael; Thursday: Lau Møller Andersen)

After a short introduction to essay writing, a specific topic within the theme *demarcation of science* will be revealed, which an essay should be written on

**Lecture 4 (week 9) –** Falsificationism (Lau Møller Andersen)

Readings:

- (Chapters 1&3) Popper, K., 2002. The Logic of Scientific Discovery, 2nd ed. Routledge, London. https://doi.org/10.4324/9780203994627
- Bechtel, W. (1988). *Philosophy of Science: An Overview for Cognitive Science.* Erlbaum. Read pages 17-37. Available on Brightspace

**Class 4** – Peer feedback (Tuesday: Lau Møller Andersen; Thursday: Aleksander Moeslund Wael)

After a short introduction on how to best give feedback, pairs of students will take turns providing feedback on each other’s essays.

**Lecture 5 (week 10)** – Paradigms in cognitive science (Lau Møller Andersen)

Readings:

- Sections I, II & X Kuhn TS, 1973. The structure of scientific revolutions, 2nd enl. ed., 4th impress. ed, International Encyclopedia of Unified Science ; vol. 2, no. 2. University of Chicago Press, Chicago. Book extract made available on Brightspace
- Bechtel, W., Abrahamsen, A., and Graham, G. (2001). Cognitive science: History. *International Encyclopedia of the Social and Behavioral Sciences.* New York: Elsevier, pp. 2154-2158.

**Class 5** – Mock oral exam (Tuesday: Aleksander Moeslund Wael; Thursday: Lau Møller Andersen)

After a short introduction on the format, students will prepare a presentation on a question. Students will work in pairs where each student has a unique question. Following the preparation, students will take turns being the examiner and the examinee.

**Lecture 6 (week 11) –** Library lecture (Library personnel) + AU course on data protection (GDPR) https://brightspace.au.dk/d2l/le/discovery/view/course/30198 (this is a mandatory course, you have to complete in your own time)

**Class 6** – Debate contest (Tuesday and Thursday: Lau Møller Andersen)

## *Part 2 – Philosophy of cognitive science*

**Lecture 7 (week 12) –** Behaviourism + mid-way evaluation (Lau Møller Andersen)

Readings:

- Skinner, B. F. (1990). Behaviourism. In *Reason at Work: Introductory Readings in Philosophy* (S. M. Kahn, P Kitcher, G Sher, & P. J. Markie, Eds.) pp. 683-700. [Extract from Skinner's Science and Human Behaviour]. Book extract made available on Brightspace
- Dennett, D. C. (1981). Skinner skinned. In *Brainstorms: Philosophical Essays on Mind and Psychology* (D. C. Dennett, Ed.) pp. 53-70. Book extract made available on Brightspace
- Hampton, R.R., 2009. Multiple demonstrations of metacognition in nonhumans: Converging evidence or multiple mechanisms? Comp Cogn Behav Rev 4, 17–28. *Are monkeys capable of introspection? (Are humans?)*

**Class 7** – Essay writing (Tuesday and Thursday: Aleksander Moeslund Wael)

**Lecture 8 (week 13)** – Computationalism (Niels Christian Hansen)

Readings:

- Marr, D. (1982). *Vision: A Computational Investigation into the Human Representation and Processing of Visual Information.* New York: Freeman. *Chapter 1 available on Brightspace*
- Rescorla, M. (2015). The computational theory of mind. *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.), http://plato.stanford.edu/entries/computational-mind/

**Class 8** – Peer feedback (Tuesday: Lau Møller Andersen; Thursday: Aleksander Moeslund Wael)

**Lecture 9 (week 14) –** Critique of computationalism (Niels Christian Hansen)

Readings:

- Searle, J. R. (1990). Is the brain's mind a computer program? *Scientific American, Jan,* 26-31.
- Harnad, S. (1995). Computation is just interpretable symbol manipulation; cognition isn't. *Minds and Machines, 4,* 379-390.

**Class 9** – Mock oral exam (Tuesday: Aleksander Moeslund Wael; Thursday: Lau Møller Andersen)

**Lecture 10 (week 16)** – Connectionism (Niels Christian Hansen)

Readings:

- Churchland, P. M. & Churchland, P. S. (1990). Could a machine think? *Scientific American, Jan*, 32-37.

- Churchland, P. S. & Sejnowski, T. J (1990). Neural representation and neural computation. *Philosophical Perspectives, 4*, 343 – 382.

**Class 10** – Debate contest (Tuesday and Thursday: Lau Møller Andersen)

**Lecture 11 (week 17)** – Embodiment (Niels Christian Hansen)

Readings:

- Spencer, J. P., Clearfield, M., Corbetta, D., Ulrich., B., Buchanan, P., & Schöner, G. (2006). Moving toward a grand theory of development: in memory of Esther Thelen. *Child Development, 77*(6), 1521-1538

- Wilson, R. A. & Foglia, L., *Embodied Cognition* (2015). *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.), http://plato.stanford.edu/archives/win2015/entries/embodied-cognition

**Class 11** – Essay writing (Tuesday and Thursday: Aleksander Moeslund Wael)

**Lecture 12 (week 18)** – Consciousness (Lau Møller Andersen)

Readings:

- Nagel, T., 1974. What Is It Like to Be a Bat? The Philosophical Review 83, 435–450. https://doi.org/10.2307/2183914 *A very influential article presenting a case for the irreducibility of phenomenology to a materialist framework.*
- Dennett, D.C., 1991. What it is like to be a bat. Presented at: New York University Philosophy Department, April 5: https://ase.tufts.edu/cogstud/dennett/papers/what_is_it_like_to_be_a_bat.pdf *An argument that we can understand what it is like to be a bat*
- Ramsey, W., 2021. Eliminative Materialism, in: Zalta, E.N. (Ed.), The Stanford Encyclopedia of Philosophy. Metaphysics Research Lab, Stanford University. https://plato.stanford.edu/archives/fall2021/entries/materialism-eliminative/ *Theories including common-sense, mental concepts like beliefs, desires, wishes, motivation are wrong*

More on eliminativism:

- Churchland, P.M., 1981. Eliminative Materialism and Propositional Attitudes. The Journal of Philosophy 78, 67–90. https://doi.org/10.5840/jphil198178268 *The original formulation of eliminativism*

**Class 12 –** Peer review (Tuesday: Lau Møller Andersen; Thursday: Aleksander Moeslund Wael)

**Lecture 13 (week 19)** – Final evaluation: What have we learnt? Wrap-up of course (Lau Møller Andersen)

Readings: None

**Class 13** – Mock oral exam (Tuesday: Aleksander Moeslund Wael and Lau Møller Andersen; Thursday: Aleksander Moeslund Wael)