Course Guide

PHIL 10134/PHIL 11115
The Computational Mind

Course Organiser: Dr. Mazviita Chirimuuta (m.chirimuuta@ed.ac.uk)
- Office hours: by appointment

Course Secretaries
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1. Course Topic and Objectives

Computation is the dominant approach to explaining how the mind works within psychology and neuroscience. Artificial intelligence also now holds out the promise of recreating human-like mental capacities in computing machines. To many, this suggests that cognition (thought, perception, even emotion) is a kind of computation. In this course we will explore philosophical background to the computational approach to the mind, centering our study around two questions:

- Computers compute, but do they think? (weeks 1-6)
- Is your brain a computer? (weeks 7-11)

By the end of the course you should be able to:
1. Understand the basic concepts at play in the computational theory of mind.
2. Give informed assessments of claims made about the thought-like nature of computational processes.
3. Explicate and develop well reasoned arguments for and against the claim that the brain is a kind of computer.

2.1 Assessment Structure (Undergraduate)

- Midterm 1500 Words (40%)
- Final 2500 Words (55%)
- Participation (5%)

**Deadlines**
- Midterm: 21\textsuperscript{st} October
- Final: 9\textsuperscript{th} December

2.2 Assessment Structure (Postgraduate)

- Essay Plan 1-2 Pages (15%)
- Final 3000 Words (80%)
- Participation (5%)

**Deadlines**
- Essay Plan: 11\textsuperscript{th} November
- Final: 9\textsuperscript{th} December

Midterm ‘formative’ paper is optional
- Word limit: 1500 words
- Due date: 21\textsuperscript{st} October

--- Further details on course delivery and assessment will be provided on the Learn pages for this course ---
3. Content and Readings

For each week, readings are listed below. Readings include core and secondary readings. The core readings for each week are starred (*).

**Core readings are the material that it is your responsibility to read before each class.**

Core readings are also the material on which our weekly seminar discussions will be based. Please do delve into the further reading too; these should be your first port of call when writing your essay. The core readings and as many as possible of the secondary readings are accessible via the Library Resources page on Learn.

**Some hints** Read the core readings carefully. You may find an article challenging or difficult—persist! If you do not understand something, read it again, think about it, try to make sense of it in your own words. If after multiple attempts to make sense of a passage, you still cannot, then there is a good chance that you have identified a real problem in the article—a perfect point to raise in your discussion forum, in the class, or to form the basis of an excellent essay! Jim Pryor has some wonderful tips for reading philosophy (as he says, 'you should expect to read a philosophy article more than once')

**Background reading**

The more background you know the better. A good starting point is to read one of the books listed below. Even if you already have a strong background in this topic already, I would encourage you to read one of these books during the semester to consolidate your knowledge.


And for more advanced readings:

**Part I: Computers Compute, but do they Think?**

**Week 1: Turing Machines and Defining Computation**


*Pick at least one of the following:


Week 2: Behaviourism and the Turing Test
*Turing, A. 1950 “Computing Machinery and Intelligence” Mind, 59 (236) pp. 433-460
* N. Block, N. 1981 “Psychologism & Behaviorism”. The Philosophical Review. 90: 5-43

Various essays in:

Week 3: The Functionalist Theory of Mind


Week 4: The Problem of Implementation
*M. Sprevak 2018 “Triviality arguments” in Sprevak and Colombo (eds.) The Routledge Handbook of the Computational Mind
Week 5: Representations
* Brooks, R. 1991 “Intelligence without representation” Artificial Intelligence 47:139-159

Week 6: The Only Game in Town?

Part II: Is Your Brain a Computer?

Week 7: The Machine-Organism Comparison, Historically Considered

* Hesse, M. 1961 “Models” in Chapter 1 Forces and Fields pp. 21-28


Week 8: Marr’s levels of explanation


Week 9: Computational Explanation in Neuroscience

Week 10: Brain-Like Computation: Connectionism and Deep Learning


Week 11: Deep Learning, Neuroscience and Psychology
* C. Stinson 2020 “From Implausible Artificial Neurons to Idealized Cognitive Models: Rebooting Philosophy of Artificial Intelligence.” Philosophy of Science