

CCNM17-101: Introduction to Cognitive Science Course Description

Aim of the course

Aim of the course: Historical and conceptual introduction to cognitive science from a combined philosophical, psychological, biological and computational point of view. We start with the prehistory of the cognitive paradigm and discuss how cognitivism endeavours to solve its problems. We characterize classic cogsci from the point of view of language, formal systems, and computations and discuss its basic philosophical underpinnings as well as the arising problems. Then we turn to connectionism and the soft computing, brain theory inspired metaphors of the mind, to conclude with the modern picture (and its criticism) in embodiment, the “dynamic hypothesis” as well as the new philosophy of mind.

Learning outcome, competences

knowledge:

- knows the introductory theories of cognitive sciences
- knows the most important expressions and phenomena of cognitive sciences

attitude:

- comprehensive theoretical interest

skills:

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Content of the course

Topics of the course

- I. The Nature of Cognitive Science
- 1. From Behaviorism to Cognitivism
- 2. Intentionality, Folk Psychology and the Animals
- 3. Functionalism and the Mind/Body Problem
- II: The Representational Theory of the Mind
- 1. Mind and Language. The Classical Symbolic Picture
- 2. Origins of the Computer Metaphor
- 3. Can Machines Think? The Turing Test and Understanding
- III. The Subsymbolic Paradigm and Related Matters
- 1. Connectionism
- 2. Elimination, Supervenience and Identity Theories
- 3. Individualism versus the Social Theory of Mind
- IV- Mind and Body
- 1. Consciousness and Qualia
- 2. The Dynamic Hypothesis
- 3. Embodiment
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Learning activities, learning methods

Evaluation of outcomes

Learning requirements, mode of evaluation, criteria of evaluation:
requirements

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mode of evaluation: oral or written exam

criteria of evaluation:

- Knowledge on basic concepts
- the skill of utilizing the models and methods of cognitive sciences

Reading list

• Recommended reading list

- A Reader in Cognitive Science (n.d.). Retrieved from <http://hps.elte.hu/~gk/books/cogreader.html>
- I/1. From Behaviorism to Cognitive Science
- Sellars, W. (1963). *Science, Perception and Reality*. London : Routledge & Kegan Paul.
- Skinner, B. (1938). *The Behavior of Organisms*. Englewood Cliffs: Prentice Hall.
- Tolman, E. C. (1932). *Purposive Behavior in Animals and Men*. New York: Century.
- I/2. Intentionality, Folk Psychology, and Animal Intelligence
- Searle, J. R. (1983). *Intentionality: An essay in the philosophy of mind*. Cambridge: Cambridge University Press.
- Goldman, A. I. (1993). The psychology of folk psychology. *Behavioral and Brain Sciences* 16, 15-28.
- Stich, S. (1983). *From Folk Psychology to Cognitive Science*. Cambridge, Mass: MIT Press.
- I/3. The Mind-Body Problem. Functionalism
- Dennett, D. C. (1991). *Consciousness Explained*. Boston: Little Brown.
- Putnam, H. (1960). Minds and machines. In: S. Hook (Ed.), *Dimensions of Mind* (pp. 362-385). New York: New York University Press.
- Block, N. (1995). The mind as the software of the brain. In E. E. Smith & D. N. Osherson (Eds.), *Thinking: An invitation to the cognitive science* (pp. 377-425). Cambridge, MA: MIT Press.
- II/1. Mind and Language. The Representational Conception
- Millikan, R.G. (1984). *Language, Thought and Other Biological Categories*. Cambridge, Mass: MIT Press.
- Chandler, D. (1999). *Semiotics for Beginners*. Retrieved from <http://www.argyroneta.com/s4b/semiotic.html>
- Chomsky, N. (1963). *Language and mind*. New York: Harcourt Brace Jovanovich.
- Fodor, J. A. (1981). *Representations: Philosophical Essays on the Foundations of Cognitive Science*. Cambridge, Mass: MIT Press.
- II/2. The Computational Metaphor
- Floridi, L. (2000). *Philosophy and Computing: A Webliography*. Retrieved from <http://www.wolfson.ox.ac.uk/~floridi/webliography.htm>
- Lee, J. A. N. (2000). *History of Computing*. Retrieved from <http://ei.cs.vt.edu/~history/IEEE> Computer Society: *The History of Computing*, <http://www.computer.org/history/>
- II/3. Can Machines Think?

- Turing, A. M. (1950). Computing machinery and intelligence. *Mind* LIX(236), 433-460. Retrieved from <http://hps.elte.hu/~gk/books/cog/turing.htm>
- Weizenbaum, J. (1965). ELIZA - A computer program for the study of natural language communication between man and machine. *Communications of the Association for Computing Machinery* 9(1), 36-45. ELIZA (n.d.). Retrieved from <http://hps.elte.hu/~gk/Eliza/index.html>
- Loebner-prize (n.d.). Retrieved from <http://hps.elte.hu/~gk/Loebner/TT.html>
- III/1. Symbolic and Subsymbolic Processing
- Newell, A. (1980). Physical symbol systems. *Cognitive Science* 4, 135-183.
- Newell, A., & Simon, H. (1976). Computer science as empirical enquiry: Symbols and search. *Communications of ACM* 19, 113 -126.
- McCulloch, W. S., & Pitts, W. S. (1943). A logical calculus of the ideas immanent in nervous activity. *Bulletin of Mathematical Biophysics* 7,115 - 133.
- McCulloch, W. S. (1965). *Emodiments of Mind*. Boston, Mass: MIT Press.
- IV/2. Dynamical Models of the Mind
- Chomsky, N. (1965). *Aspects of the Theory of Syntax*. Cambridge, Mass.: MIT Press.
- Fodor, J. A. (1981). *Representations*. Cambridge, Mass.: MIT Press.
- Fodor, J. A., & Pylyshyn, Z. (1988). Connectionism and cognitive architecture: A critical analysis, *Cognition* 28, 3-71.
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