

Cognitive Science Program Learning Outcomes

1. **Computational/Representational Assumption** State, explain, and debate, from diverse perspectives, the computational / representational assumption which characterizes cognitive science and provides cohesion to the field.
2. **Interdisciplinary Assumption** Discuss the nature of and motivation for the interdisciplinary assumption which characterizes cognitive science and which provides great breadth to the field.
3. **Formalisms** Discuss the types, levels, and roles of description/explanation in cognitive science. (Discuss formalisms used to describe various phenomena in psychology, linguistics, computing, biology, etc.)
4. **Symbol Systems** Define the symbol system concept, perform simple symbolic computation in LISP and Prolog, and describe classic knowledge representations which are grounded in the physical symbol system hypothesis, including semantic nets, state spaces, frames, scripts, and production systems.
5. **Neural Networking** Identify and define basic neuroanatomical components, describe fundamentals concepts associated with neuroscience, and engage in neural network modelling to the extent that conversational fluency on connectionism is achieved for purposes of application and debate.
6. **Darwinian Processes** Articulate evolutionary theory both in classical terms and from an abstract algorithmic perspective, describe the standard computational instantiations of this theory (genetic programming and genetic algorithms), and explain how evolutionary ideas and extensions are providing new insights into the nature of the mind.
7. **Linguistic Formalisms** Define the basic elements of language and model linguistic phenomena by means of generative grammars, lexicons, and knowledge representations.
8. **Psychology** Investigate the psychological plausibility of various cognitive models of psychological processes, including perception, memory, and learning.
9. **Language and Culture** Provide examples of the influence of language and culture on cognition, and discuss elements of the semiotic bridge which abstractly equates language and culture with cognition.
10. **Consciousness** Discuss issues of a philosophical nature associated with the mind, including consciousness and intentionality.
11. **Big Ideas** Identify the intellectual roots of cognitive science by citing great minds and their ideas, such as Plato and his idealism, Descartes and his dualism, Vygotsky and his developmental theories, and Chomsky and his universalism.
12. **Controversies** Characterize the big issues and controversies associated with the field, such as the Chinese Room and the Imagery Debate.
13. **Emerging Fields** Provide synopses of emerging fields which are increasingly central to cognitive science, such as situated cognition and dynamical systems.
14. **Classic Papers** Summarize a number of classic papers associated with the field based on readings of the originals.
15. **Careers and Applications** Apply the cognitive science paradigm to real world problems and explore career opportunities.