

Humanities Seminars Program

Evolution of Cognition

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The course meets WEDNESDAYS 1:00 p.m. to 3:00 p.m. on the following dates: Jan. 28, Feb. 4, 11, 18, 25, March 4, 11, 25, April 1, 8, 2015

What is intelligence? What differentiates humans from other animals? This course explores the evolution of cognition in humans and other species, and discusses how science investigates these questions. Why are humans such a unique species on earth--or are we? Why we are so good at solving some problems and yet fail so often at solving others? Research in evolutionary biology has a lot of answers to questions about why animals behave the way they do, and we will examine how this applies to our own lives. We will also touch on the underlying neurobiology, for example, on why is it that insects are so smart (using tools, navigating huge areas, using languages) when their brains are no bigger than a pinhead?

Readings:

All the readings for the class are available as PDF's that you can download from our password-protected website at <http://course.hsp.arizona.edu>. They are divided into required and optional.

The book by Sara Shettleworth, *Cognition, Evolution, and Behavior*, Oxford University Press, 2009, ISBN-13: 978-0195319842 is not required – it is recommended if you want to delve more deeply into current research on how and why cognitive abilities evolve across animals.

Schedule:

- Jan. 28 – What is cognition? – The types of problems solved, sensing, processing, decision-making; where do we find these abilities
- Feb. 4 – Evolution and purpose in biology – How does evolution work, what is heritability, how is this relevant to behavior and cognition; the role of randomness vs. purpose
- Feb. 11 – Biology and the explanations it provides – Tinbergen's four questions, mechanistic vs. functional explanations; what are we trying to explain
- Feb. 18 – Why intelligence? – What are the benefits and costs of cognitive abilities, and how do these depend on a population's environment
- Feb. 25 – Human uniqueness, or not – Tool use, language, learning, social mind – are these the hallmarks of humanity? Or is it something else? Brain size; what in human history made us unique?
- Mar. 4 – The machinery of cognition – Brains and nerve cells; brains as distributed systems
- Mar. 11 – Complex systems and a more general notion of cognitive skills
- Mar. 25 – Intelligent computers – Artificial intelligence and robots; how far along are we? What is it that makes programs seem lifelike?
- Apr. 1 – Consciousness and free will – Science and non-science, monism and determinism or not
- Apr. 8 – Discussion