What is this course about?
Human behavior is strikingly different from other animals: we speak languages, create tools, work together on large-scale endeavors, and even learn from others in university classrooms. What cognitive processes underlie these behaviors, and how did they emerge in our evolutionary history? In this course, we will examine the evolutionary origins of the human mind by integrating theoretical perspectives from biology with cutting-edge empirical research from psychology. Topics will include the origins of human cooperation, communication, theory of mind, culture, morality, emotions, memory, foresight, and self-control. This course consists primarily of lectures, with three in-class discussion seminars on topics of current debate. Each session will be paired with 2-3 readings consisting of a mixture of empirical articles and review chapters; all readings be posted electronically. Performance will be assessed through participation in discussion seminars and in-class quizzes; response papers analyzing empirical research; and a midterm and final exam.

What are the objectives of this course?
This course will integrate evolutionary theory and experimental comparative psychology to understand the evolutionary history of human cognition. The focus will be on establishing a strong foundational knowledge in the evolution of cognition, including reading and critically analyzing empirical scientific studies.

What are the pre-requisites for this course?
Pre-requisites for this course are at least one of the following courses, indicating some familiarity with psychology.
- Enforced pre-requisite: Psych 230 (Introduction to Behavioral Neuroscience)
- Alternative pre-requisites: Psych 240 (Introduction to Cognitive Psychology) or Psych 250 (Introduction to Developmental Psychology)

How are grades determined?
Your course grade will be determined by:
- Your participation in three class discussions (10%)
- Quizzes (10%)
- Three response papers (10% each; 30% total)
- A midterm (20%)
- A cumulative final (30%)
What are course sessions like?
Most sessions consist of lectures, and students are expected to attend lectures. Three class sessions (dates indicated below) will involve in-class discussion, and your participation in those discussions will comprise your participation grade. For each session, we will discuss the assigned papers in class so you should have read those papers prior to class.

- **Missed discussion sections**: If you miss a discussion session your participation grade will be docked by 1/3.
- **Make-ups**: If you have a documented reason for missing a discussion (letter from doctor or LSA advisor documenting illness or emergency; letter from another professor, advisor, or coach documenting unavoidable conflict), then you will be allowed to make up this part of your participation grade by writing an additional response paper about the three readings discussed in that session. This response paper will be due no later than 1 week after the discussion session, except in cases of documented illness or emergency that preclude completion of the work in that timeframe.

Where are the readings and lecture slides?
- Readings are organized by class sessions (under Modules on the Canvas website).
- Pdfs of slides will be posted online in the relevant module after the lecture. Why after the lecture? A couple of reasons: (1) the answers to the quizzes are in the lectures; (2) I sometimes change the order of material during the sessions to respond to student comments, so I post slides that reflect what you actually saw in the lecture.

What’s the deal with quizzes?
Some lectures will commence with an initial quiz, focusing on material covered the previous week (dates noted below). This quiz will serve as a check-in for yourself as well as a way for us to gauge class-wide comprehension of critical concepts.

- **Grading**: Quizzes will be graded with a check if you complete the quiz (regardless of response accuracy), and a minus if you are absent (or do not make a good-faith effort to complete the quiz, for example by answering some questions or filling out the quiz with a meaningless non-intelligible response).
- **Final score**: If you complete at least 8 of 10 quizzes with a check, then you will get full credit on the quiz portion of your grade. Some basic subtraction therefore reveals you get two freebies—yay! As such, there will be no make-up quizzes offered. Failing to complete each additional quiz below the requisite 8 will reduce your total quiz score by 10% (e.g., completing 7 quizzes results in a score of 90% for that portion of your grade).

How do response papers work?
Understanding how to critically read empirical research and synthesize theoretical ideas are critical jobs both for scientists and the public at large. You will therefore complete three response papers that summarize a paper’s argument, and then either argue your point of view, critique their interpretation of their data, or sketch a proposal for a new experiment building on their work.
• **Instructions:** Guidelines for specific response papers will be posted on Canvas.

• **Format:** At least 2 but no more than 2 1/2 pages, single spaced, 1 inch margins, 12pt Times New Roman font. **Your grade will be dropped by 10% for not following this format.** Please include your name, date, and the response paper number in the document header. Name your files: [Lastname_Firstname]_Response_[papernumber], e.g., “Smith_Joan_Response_3.doc”

• **Deadline:** Your response paper must be uploaded to the Canvas website (under that assignment) **by 10PM on the day it is due.** Response papers will be graded on a 10-point scale. **Every day your paper is late will reduce your score by 10%, starting at 10:01PM that day.**

• **Extensions:** If you have a **documented** reason for missing the paper deadline (letter from doctor or LSA advisor documenting illness or emergency), then you may be granted an extension. **This response paper will be due no later than 1 week after the original deadline,** except in cases of documented illness or emergency that preclude completion of the work in that timeframe. Extensions will not be granted because the deadline conflicts with work in other classes, electronic catastrophes, or the like—you should rather try to turn it in as soon as possible after the deadline to limit the number of points that get dropped and take this as a friendly, low-key life lesson in time management.

**What about the midterm and final exam?**
The midterm will be in class (see date below), and there will be a final exam during the scheduled exam period for this class.

• **Exam format:** Exams will be composed of a mixture of multiple choice, true/false, fill in the blank, and matching questions, as well as short (paragraph-length) essays. **Accommodations:** Students with disabilities will always be accommodated. Please consult me at least two weeks before an exam to explain your requirements for ADA accommodations (e.g. different room, longer exam period).

• **Missed exams:** Make-up exams will not be allowed except in the case of documented medical or familial emergencies.

**What is the laptop and device policy for this course?**

• **Short answer:** No laptops or other devices are routinely allowed in this course. Take notes on paper in class. Print out the readings for discussions. Welcome to the twentieth century!

• **Long answer:** You’ve probably heard the stats on how taking notes by hand can improve academic achievement. That’s all great, but I view it as your decision (and/or responsibility) to use or ignore this kind of information. However, one side effect of your decision to use a laptop or phone in class is that it can distract other people, and one of those other people it definitely does distract is me. Most students use computers in appropriate ways in class, but some do not. I have decided that the negative consequences (for all of you) of me being distracted by students using their devices in an unprofessional manner outweighs the value of each member of our course making
an autonomous decision about using said devices. This has led me to switch to an ‘analog’ classroom.

- **What if you need to use a computer?** If you really need to use a computer to learn effectively, send me an email with a paragraph stating your case. (Hint: “I want to use a computer” is not an effective argument). I will then ask you to vigilantly make sure you only use the computer for class-related notes, not internet, chatting, etc. Specific accommodation-needs for computers will of course always be met.

- **What about phones?** I think you will be hard pressed to convince me that you need a phone to learn effectively, but you are welcome to try.

**Does this course have an academic Integrity policy?**

Yes! **Of course it does.** First off, discussion and the exchange of ideas are essential to academic work. For response papers or other assignments in this course, you are encouraged to consult with your classmates on the choice of paper topics and to share resources or help each other understand the papers. **However, you should ensure that any written work you submit for evaluation, including exams and responses papers, is your own—the result of your own research, ideas, and writing.** You must also adhere to standard citation practices and properly cite any books, articles, websites, lectures, etc. that have helped you with your work as relevant.

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**COURSE TOPICS AND READINGS BY WEEK**

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**Week 1: Human uniqueness I**

1. **January 9: The puzzle of human cognition**

   Darwin famously said, “the difference in mind between man and the higher animals, great as it is, certainly is one of degree and not of kind.” Biologists, psychologists, and philosophers since have debated the degree of continuity or discontinuity between human and animal minds. What is (potentially) distinct about human minds? How can we test these ideas scientifically?

   *Introduction to course and objectives. No readings.*

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**Week 2: Theory I**

2. **January 14: Humans are a (weird) primate**

   What’s different about human behavior compared to other species? What’s shared? This lecture will cover behavioral differences between humans and our close relatives, focusing on great apes and traditional human societies such as hunter-gatherers.
Readings:

3. January 16: What is cognition?
How is behavior implemented in the mind and brain? This lecture will cover some basic ideas we will use in the rest of the course: the difference between observable behavior and underlying mental states (and how experimental methods can parse those mental states), theories about how the mind is structured (empiricism, nativism, domain specificity, and modularity), and levels of analysis for understanding behavior (mechanism versus evolution).

Readings:

Week 3: Theory II

January 21: ** MLK HOLIDAY NO CLASS **

4. January 23: What is evolution?
How do traits (such as cognition) evolve? This lecture will cover basic concepts relevant for understanding the evolution of cognition, including: phenotype and genotype, natural selection, adaptations, and phylogeny (patterns of relatedness between populations).

Readings:

Week 4: Theory III

5. January 28: Why does cognition evolve?
Are there different ways to be smart? And what are the potential benefits? This lecture will cover theories for why organisms (such as humans) might evolve intelligent or flexible behavior.

Readings:
• Herrmann et al (2007). Humans have evolved specialized skills of social cognition: The cultural intelligence hypothesis. *Science.*

**QUIZ 1: Natural selection**

6. January 30: How is cognitive evolution measured?
We cannot see cognition directly, and it leaves no trace in the fossil record. So how can we tell if cognition has evolved across time and populations? This lecture will cover the techniques used to detect cognitive evolution, including: the comparative method, differences in fitness, genetic signatures of selection, and brain evolution.

**Readings:**

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**Week 4: Social cognition I**

7. February 4: Theory of mind
Humans can think not only about other’s observable behavior, but also about unobservable mental states that drive that behavior: other people’s thoughts, desires, and goals. Can other animals do the same? How might differences in “theory of mind” change human behavior compared to other species?

**Readings:**
• Apperley (2011). *Mindreaders.* Chapter 1 – Introduction; Chapter 3 - Evidence from infants and animals.
• Krupenye et al (2016) Great apes anticipate that other individuals will act according to false beliefs. *Science.*

**QUIZ 2: Comparative method**

8. February 6: Language and communication
One of the most striking differences between humans and nonhumans is our language abilities. What are the core features of human language, and how do they differ from nonhuman communicative capacities? Does human language have its roots in vocal communication or gesture? Can other animals remark about the world?
Readings:
- Cheney & Seyfarth (1990) *How monkeys see the world*. Chapter 4 – Vocal Communication; Chapter 5 – What the vocalizations of monkeys mean.

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**Week 5: Social cognition II**

9. February 11: Mutualism and reciprocity

Human society is marked by high degrees of cooperation between individuals to reach larger goals. What skills do other species use to work together? How do these skills shape the organization of primate social life?

Readings:

**QUIZ 3: Theory of mind**

10. February 13: **CLASS DISCUSSION**—Altruism

Tennyson famously said that nature was “red in tooth and claw.” Yet humans see to care about giving others a helping hand and being fair. Do other species exhibit such responses, and what does it mean if they do? Complete readings before class!

Readings:
- Bullinger et al. (2014) Chimpanzees instrumentally help but do not communicate in a mutualistic cooperative task. *Journal of Comparative Psychology*.

In class: response paper instructions for first response paper due Feb 27.
Week 6: Social cognition III
11. February 18: Emotions
Darwin noted that “the fact that the lower animals are excited by the same emotions as ourselves is so well established, that it will not be necessary to weary the reader by many details.” Yet those details have been debated ever since. So, what are the details? Do nonhumans have emotional experiences like humans, at least in part?

Readings:

February 20: ** MIDTERM ** (Topics including this week)

Week 7: Ecological cognition I
12. February 25: Tools and culture
When Jane Goodall first discovered that chimpanzees make tools, Louis Leakey famously wrote that “we must redefine ‘tool’, redefine ‘man’, or accept chimpanzees as humans.” Yet our abilities to copy and learn from other’s behavior—such as to create material culture—seem to far exceed other species. How do other species use tools, how do they learn to do so, and are these behaviors “cultural”?

Readings:

QUIZ 4: Cooperation

13. February 27: Memory and planning
Some have proposed that animals are “stuck in time” because they cannot imagine past or future events like humans do. How do animals think about previous episodes or plan for the future? Can animals engage in “mental time travel?” Does it matter if we cannot know for sure if their experience is like ours?

Readings:

• Kano & Hirata (2015). Great apes make anticipatory looks based on long-term memory of single events. *Current Biology.*

**Response paper 1: Primate social cognition. DUE WEDNESDAY FEBRUARY 27 at 10PM.**

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**March 4:** **‘SPRING’ BREAK NO CLASS**

**March 6:** **‘SPRING’ BREAK NO CLASS**

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**Week 8: Ecological cognition II**

14. March 11: Rationality
The last few decades of research in psychological and behavioral economics indicates that humans can be quite irrational when making decisions. Do other species show similar biases? What can this tell us about defining rationality in humans?

*Readings:*

**QUIZ 5: Memory**

15. March 13: Decision-making
Animals face constant decisions where they must trade-off between costs and benefits while foraging; humans face similar tradeoffs making financial decisions. How do we compare? This session will build off several concepts discussed in the prior lecture on rationality.

*Readings:*
Week 9: Ecological cognition III

16. March 18: CLASS DISCUSSION—Self-control
Problems of self-control, such as dieting, saving money, or preparing for the future, are a challenge for people. How do animals fare? Do humans have special abilities to exert self-control? Complete readings before class!

Readings:

17. March 20: Metacognition and self-awareness
Metacognition encompasses a set of cognitive processes allowing individuals to think about thinking. While humans can contemplate their own mental states across a variety of domains, it is debated whether such representational abilities are a human-specific ability or more widely shared.

Readings:
- Beran et al (2013) Language-trained chimpanzees (*Pan troglodytes*) name what they have seen, but look first at what they have not seen. *Psychological Science*.

QUIZ 6: Decision-making
Reminder about response paper due March 27.

Week 10: Cognitive Development

18. March 25: Human cognitive development
Human cognition does not emerge from the womb fully formed: the mind and behavior of an infant is not identical to that of an adult. How do different cognitive abilities develop over human ontogeny? What is the basis of cognitive change within an individual’s lifespan?

Readings:
19. March 27: Life history and comparative development
How do human developmental patterns differ from that of other primates? What role does development play in shaping variation in cognition across species generally? Does development play a special role in the emergence of uniquely-human cognition?

*Readings:*
- Rosati et al. (2014). Comparative developmental psychology: How is human cognitive development unique? *Evolutionary Psychology*

*QUIZ 7: Metacognition*

*Response paper 2: Primate ecological cognition. DUE MARCH 27 at 10PM.*
Pick one of the following: Memory and mental time travel - Kano & Hirata (2015); Decision-making - Brosnan et al (2007); Metacognition: Beran et al (2013).

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**Week 11: Convergent evolution I**

20. April 1: Domestication
Humans have shaped the bodies and behavior many different animals. This session will examine how artificial selection shapes cognition across species, with a special focus on how changes in development are a mechanism for generating evolutionary change.

*Readings:*

*QUIZ 8: Life history and development*

21. April 3: **CLASS DISCUSSION**—Dogs and wolves
Dogs and humans have lived together for thousands of years, and most people with a pet dog have an anecdote about a time their dog did something suspiciously human. But was it? This session will examine the hypothesis that dogs have evolved special cognitive skills for living with humans, though comparisons of dogs and wolves. Complete readings before class!

*Readings:*

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**Week 12: Convergent evolution II**

**22. April 8: Birds and reptiles**

Is being accused of having a birdbrain actually an insult? This lecture will cover recent evidence for sophisticated behavior and cognition and birds, and make the case that some bird species can be considered a “feathered ape.” We will also look at whether some mammalian and avian skills have deep roots in reptile cognition.

*Readings:*

**23. April 10: Mammal grab bag**

Lots of big-brained mammals such as elephants and dolphins are colloquially considered smart, e.g. “an elephant never forgets.” Is that actually true? What about instances of intelligence in other taxa, such as hyenas? Is there some commonality governing which species show complex cognition?

*Readings:*

**QUIZ 9: Domestication**
Week 13: Reconstructing the minds of extinct species

24. April 15: Hominin brains and genes
Scientists already debate whether we can ever really know what another species is thinking or experiencing. This problem is even more difficult when thinking about extinct species like our hominin ancestors. How can we reconstruct the mind of these creatures in order to understand human uniqueness? This session will integrate approaches from neurobiology and genetics.

Readings:

QUIZ 10: Convergence

25. April 17: Hominin archeology
Some extinct creatures leave us additional clues to what they were thinking: they used tools, built graves, or wore decorations. This session will integrate approaches from the archeological record to examine human cognitive evolution

Readings:

RESPONSE PAPER 3: Cognitive Convergence. DUE APRIL 17 AT 10PM.
Pick one of the following species: foxes—Hare et al (2005); BIRDS – Kabadayi & Osvath (2017), or elephants—Plotnik et al (2011).

Week 14: Human Uniqueness III

26. April 22: Wrap up: Why we need animals to understand human cognition
No readings.