COURSE DESCRIPTION

The ways that non-human animals behave have fascinated and mystified humans since people first made drawings on the walls of ancient caves, and they continue to capture our attention. We watch them and invent explanations for their behavior, often with little evidence. Much as the ancient Greeks anthropomorphized their gods, giving them human traits, we do the same to animals: They are “sneaky,” “wise,” “stupid,” “jealous”...and they are, ultimately, dumb—and therein lies the mystery. How can we understand a non-speaking creature on its own terms? Can we know how the birds at dawn begin to sing, all at the same time? How do we understand the intelligence of fish? The map-making of honeybees? Do animals think? How would we know?

This seminar will engage students in the exploration of science as a way of knowing, using animal behavior as a gateway into that world. The seminar considers what counts as scientific knowledge, and by whom; the methods employed to gain or affirm scientific knowledge; the values attributed to scientific knowledge; and the ethical and aesthetic implications of what one gains and does with the acquisition of knowledge. Students will integrate the history and philosophy of science with content of, and approached used, in a scientific discipline in discussions and assignments.

The seminar focuses on topics that are particularly relevant to questions about how we know about animal behavior (and by extension, all of science) and to aspects of animal behavior that are accessible and useful to us as fellow travelers in the natural world. Feel free to read all of the text, not just assigned chapters, to devour good videos online, and to generate your own hypotheses about what is going on in the natural world!

COURSE LEARNING OBJECTIVES

After completing this course, a successful student will be able to:

1. Present and assess the major approaches to distinguishing science from other intellectual pursuits.
2. Apply and integrate ways of knowing in the sciences to contemporary issues and topics in a scientific discipline.
3. Creatively engage and integrate the science with expression of one’s own understanding and experience.
4. Explore and appreciate how scientific knowledge is produced, constructed, expressed, and contested in a scientific discipline.
5. Explain the potential sources of a distinctive rationality or objectivity that scientific knowledge might be thought to possess.
6. Articulate the value and purpose of ways of knowing in and through the sciences.
7. Describe crucial differences among the kinds of evidence adduced in favor of scientific claims, and explain the significance of these differences.
8. Critically assess interdisciplinary connections and interdependent overlaps between ways of knowing in the arts and humanities and the natural sciences.

REQUIRED TEXTS:

COURSE SCHEDULE: TOPICS, READINGS, AND OTHER MATERIALS

Introduction
Week 1: What do we know about animal behavior and how do we know it? Breed & Moore --Chapter 1, “Of Cockroaches and Wolves: Framing Animal Behavior”
Weeks 2 through 6 – The Nature and Values of Knowing in the Sciences

Week 2: Science and Pseudoscience
Karl Popper, “Science: Conjectures and Refutations”
Thomas Kuhn, “Logic of Discovery or Psychology of Research?”

Week 3: Science and Objectivity
Helen Longino, “Values and Objectivity”
Lorraine Daston, “Objectivity and the Escape from Perspective”

Week 4: Scientific Ignorance, Scientific Knowledge, and Their Applications
Stuart Firestein, “The Quality of Ignorance”
Stuart Firestein, “Case Histories”
Laurence M. Krauss, “What Is Science Good For?”

Week 5: Experimental, Observational, and Statistical Evidence
Samuel Scheiner, “Experiments, Observations, and other Kinds of Evidence”
Nate Silver, “Less and Less and Less Wrong”

Week 6: Crucial Historical and Methodological Episodes
Barry Gower, “Isaac Newton: Rules for Reasoning Scientifically”

Weeks 7 through 12 – Knowing in a Scientific Discipline (Case Studies)

Week 7: Is animal behavior instinctive or learned, and why is that an ignorant question?
Wyatt—Chapter 3, “How Behaviour Develops”

Week 8: How do animals learn?
Wyatt—Chapter 4, “Learning and Animal Culture”
Listen to “How Smart Are Fish?” https://naturallyspeaking.blog/2017/02/22/episode-49-how-smart-are-fish/

Week 9: Cognition—does behavior represent thought? How do we know?
Breed & Moore—Chapter 6, “Cognition”

Week 10: Animal Communication—what does it mean?
Breed & Moore—Chapter 7, “Communication”
Galambos, R. 1942. The avoidance of obstacles by flying bats: Spallanzani’s ideas (1794) and later theories. Isis 34: 132-140.

Week 11: Welfare: what does animal behavior tell us what animals want and/or need?
Braithwaite—Chapter 5, “Drawing the Line”

Week 12: Applied Animal Behavior
Breed & Moore—Chapter 15—“Conservation and Behavior”
Braithwaite—Chapter 6, “Why It Took So Long To Ask the Fish Pain Question—and Why It Must Be Asked”
Braithwaite—Chapter 7, “Looking To the Future”
Weeks 13 through 14 – Formal Presentations

Week 15: Conclusion and wrap up

Week 16: Final Critical Analysis and Research Writing Projects

**EVALUATION SYSTEM**

The requirements that will be used to evaluate student learning are:

1. Discussion question assignments (10% of grade). Weekly one-page writing assignment on readings or video assignments (10 total).
2. Two writing projects (35% of grade). Writing assignments (5-10 pages each) can be in the form of a traditional academic essay, personal essay, creative nonfiction, fiction, poetry, or art/design project with narrative.
3. Formal speech (20% of grade). A 7-minute extemporaneous speech to the class related to content.
4. Analytical research writing project (10-20 pages; 25% of grade).
5. Participation (10% of grade).

**GRADING**

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<tr>
<th>Assignment</th>
<th>Percentage</th>
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<tr>
<td>Participation</td>
<td>10% (30 pts)</td>
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<tr>
<td>Discussion question assignments (10)</td>
<td>10% (30 pts)</td>
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<tr>
<td>Writing projects (2)</td>
<td>35% (105 pts)</td>
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<tr>
<td>Final research paper (1)</td>
<td>25% (75 pts)</td>
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<tr>
<td>Formal speech (1)</td>
<td>20% (60 pts)</td>
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<td>Total</td>
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Grade distribution (plus/minus grades may be used):

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<tr>
<td>90-100%</td>
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<td>80-89%</td>
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<td>70-79%</td>
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<td>60-69%</td>
<td>D</td>
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<td>&lt;60%</td>
<td>F</td>
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**Incomplete**

The grade of “I” is a temporary grade awarded to indicate that for reasons beyond the student’s control or that the student could not have reasonably have anticipated, he/she could not complete the requirements for the course. When an instructor assigns an “I,” he/she shall specify in writing the requirements the student shall fulfill to complete the course. After one year, or at the end of the semester in which the student graduates (whichever comes first), an “incomplete” grade will automatically changed to an “F” grade unless the course has been completed and the grade change submitted. Student must be in good academic standing in the class in order to receive an incomplete. (CSU Faculty Council policy)

**More about behavior (yours):** This course will adhere to the Academic Integrity Policy of the Colorado State University General Catalog and Student Conduct Code. Dishonesty, including cheating on exams, plagiarism, and all that, is so strongly discouraged that you are likely to fail the course if you attempt it.

Academic integrity is a serious matter, and we treat it that way. This course will adhere to the CSU Academic Integrity Policy as found in the General Catalog and the Student Conduct Code: [http://catalog.colostate.edu/general-catalog/policies/students-responsibilities/#academic-integrity](http://catalog.colostate.edu/general-catalog/policies/students-responsibilities/#academic-integrity). At a minimum, violations will result in a grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services. Academic misconduct includes (but is not limited to) the following behaviors:

1. cheating—using unauthorized sources of information of information and providing or receiving unauthorized assistance on academic work
2. plagiarism—representing the language, ideas or thoughts of another as your own without proper acknowledgement
3. unauthorized possession or disposition of academic materials
4. falsification—any verbal or written untruth in academic work
5. facilitation—knowingly assisting another to commit an act of academic misconduct
See TILT’s Academic Integrity Program website for more information.

**Honors Competencies and Skills for Honors Students (“PICC” feedback)**

The CSU University Honors Program has prioritized four general competencies skills that should be addressed in each honors course. These skills include (1) **Professionalism**, interpersonal skills, and emotional intelligence; (2) Interdisciplinary learning integrated with global and/or cultural viewpoints; (3) **Critical thinking**; and (4) **Creativity and problem solving**. This is a two-stage process. First students complete a self-evaluation of these skills at the beginning of the semester. At the end of the semester instructors will provide feedback for each student, based on assignments and activities. The feedback is part of the University Honors Program; it is for advising purposes only and is confidential. It is not part of a student's grades or academic record. A standardized rubric is used to provide feedback for growth in these areas and to measure the Honors Programs progress in helping students to develop these skills through their academic career. The feedback categories and activities/assignments used to measure progress in HONR 292 are listed below and noted in the assignment descriptions.

<table>
<thead>
<tr>
<th>Skill Category (PICC)</th>
<th>Relevant Course Activities &amp; Assignments</th>
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| 1. **Professionalism, interpersonal skills, & emotional intelligence**: Acts ethically & positively to foster a supportive instructional or work environment. Has the emotional intelligence (ability to perceive, evaluate, & manage emotions) & interpersonal skills to work effectively with others. | • Class participation & conduct  
• Discussion question assignments  
• Formal speech |
| 2. **Interdisciplinary learning integrated with global &/or cultural viewpoints**: Integrates diverse knowledge, perspectives, &/or skills into arguments &/or strategies; is aware of and can clearly incorporate global &/or cultural perspectives to an argument or issue. | • Class discussions  
• Discussion question assignments  
• Writing projects  
• Final research paper  
• Formal speech |
| 3. **Critical thinking**: Student advances a position with specific theses or hypotheses & can conceptualize ideas or lines of thought. Conclusions and related outcomes acknowledge complexities of an issue (implications and consequences) and recognize differing points of view. Formulates & develops claims with sufficient support, including reasoning, evidence, & persuasive appeals, & proper attribution where necessary. Uses written and oral communication effectively in persuasive arguments. | • Class discussions  
• Discussion question assignments  
• Writing projects  
• Final research paper  
• Formal speech |
| 4. **Creativity & problem solving**: Creatively applies discipline-based and/or cross-discipline-based knowledge to discover and design a variety of forms often using a problem-solving strategy | • Class discussions  
• Discussion question assignments  
• Writing projects  
• Final research paper  
• Formal speech |