Syllabus

PHIL 4883–001: Cognitive Science (64090)

Fall 2023

1 Logistics

Instructor: Dr. Caton
Lecture: TR, 9:30–10:45AM
Locale: Humanities and Social Sciences 2005
Office: Humanities and Social Sciences 4052
Office Hours: TR, 12:30–2:00PM
Office Phone (w/ voicemail): 870.972.2626

Email: jcaton [AT] astate.edu
Course Page: Canvas
Required Texts:
Bermúdez (2020): *Cognitive Science: An Introduction to the Science of the Mind* (3rd ed.), Cambridge. ISBN: 9781108440349

2 Course Description

Cognitive science is a wide-ranging area of study focusing on cognition from a variety of perspectives.

This course surveys a number of foundational issues in cognitive science, especially issues involving the various sorts of formal models which have been suggested as ways of understanding how human cognition works. We begin by considering a model which has done much to shape the modern field of cognitive science: to have a mind is just to be running a certain sort of algorithm or computer program. We then consider several alternative models of cognition as occurring within distributed connectionist networks, within disparate collections of well-tuned interacting devices, or within complex dynamical systems. We will conclude the course by reviewing applications of our models to language learning, object perception, "mindreading", robotics, and machine learning.

3 Course Goals/Student Learning Outcomes

Program Outcomes: this course contributes to the following program-level outcomes (level: mastery):

1) Students will understand central issues and theories in philosophy (from among the major areas of metaphysics, epistemology, and value theory).
2) Students will be able to analyze and explain complicated ideas.
3) Students will be able to analyze arguments.
4) Students will be able to evaluate arguments.

Course-Level Student Learning Outcomes: students should be able to recognize and discuss central views in cognitive science, and identify their implications.

Assessment of Learning Outcomes: Course-level SLOs will be assessed by short-answer essay questions.

4 Grading Criteria

Your course grade (100 possible points) will be a weighted average of the following:

1. **Homework**: 15%
2. **Paper 1**: 20% [Sept. 26]
3. **Paper 2**: 25% [Nov. 7]
4. **Argumentative Paper**: 10% [Dec. 7]
5. **Final Examination**: 30% [Dec. 14]

Description of the Assignments:

Homework will consist of a general question about the week's readings, then a prompt for a reaction to the material. Homework is approximately 1 page in length and will be posted on Canvas. You will upload your answers to the homework in Canvas as a PDF file. **I only accept PDF files.** More instructions will be posted on the assignment.

Paper 1 and **Paper 2** are 6 page papers. I will provide several questions based on the readings and lecture. You will upload your answers to the Papers in Canvas as a PDF file. **I only accept PDF files.** More instructions will be posted on the assignment. With my supervision, it is possible for you to develop your own paper topic. In such a case, you must have an email exchange with me about your topic *before* you submit your paper.

The **Argumentative Paper** is a 6 page paper where you present and defend a new (to you) conclusion (in cognitive science) on the basis of an argument. You must give your argument in premise/conclusion form, provide reasons why the premises are true, and respond to possible objections. You will upload a **PDF** of your paper in Canvas by the last day of class (Dec. 7).

The **Final Examination** is an 8 page paper. I will provide several questions based on the readings and lecture. You will upload your answers to the Final in Canvas as a PDF file. **I only accept PDF files.** More instructions will be posted on the assignment.

Grading Scale:

Your course grade will be determined by the above weighted average. A letter grade will be assigned by the grading scale given below. In borderline cases I can consider factors such as class participation, regular attendance, and overall improvement in the course. What counts as a borderline case is determined by the entire class' overall performance.

A: 90–100
B: 80–89
C: 70–79
D: 60–69
F: 0–59

5 Readings

I will post the reading assignments on Canvas with the expectation that you will read *before* I cover the material in class. This schedule is tentative and subject to change. The actual reading assignments will appear on Canvas. (Reading assignments are for the week listed.)

Aug. 22: [Introduction]

> Bermúdez, 3–11

Aug. 29: [History of Cog. Sci.]

> Bermúdez, 12–64

Sept. 5: [Focus on the Brain]

> Bermúdez, 65–95

Sept. 12: [Model: Physical Symbol Systems]

> Bermúdez, 96–122

Sept. 19: [Model: Physical Symbol Systems *cont.*]

> Clark, "Mindware as Software"[‡]
>
> Clark, "Symbol Systems"[‡]

Sept. 26: Paper 1

Sept. 28: [Coding]
(Examples in the Pyret programming language.)

Oct. 3: [Model: Neural Networks]
Bermúdez, 123–148

Oct. 10: [Model: Dynamic Systems Theory]
Bermúdez, 149–170

Oct. 17: [Model: Bayesianism in Cognitive Science]
Bermúdez, 171–202

Oct. 24: [Modules and Architechtures]
Bermúdez, 203–228

Oct. 31: [Application: Models of Language Learning]
Bermúdez, 256–284

Nov. 7: Paper 2

Nov. 9: [Application: Object Perception and Folk Physics]
Bermúdez, 285–306

Nov. 14: [Application: Exploring Mindreading]
Bermúdez, 335–356

Nov. 21: [Thanksgiving Break] No Class

Nov. 28: [Application: Machine Learning]
Bermúdez, 307–334

Dec. 5: [Robotics: From GOFAI to Situated Cognition and Behavior-Based Robotics]
Bermúdez, 407–436

Dec. 7: [Robotics *cont.*, Last Day of Class]
TBD

Dec. 14: Final Exam (Thurs., 8:00am, Humanities and Social Sciences 2005)

‡ Reading available on Canvas.

6 Academic Integrity and Administration

1. Plagiarism of any kind is not tolerated and will be prosecuted through the appropriate University offices. Plagiarism is the act of taking and/or using the ideas, work, and/or writings of another person as one's own. Cheating is obtaining and/or using information in a fraudulent manner. Both are serious offenses against academic integrity that could result in failure for the assignment, and/or failure for the course, and/or expulsion from Arkansas State University.

   You are responsible for knowing and conforming to the University code of academic integrity, which you may find at:

   https://www.astate.edu/a/student-conduct/index.dot

2. If you have a disability which makes it difficult for you to succeed in this course, please contact me as soon as possible. Your privacy will be respected and every effort will be made to meet your needs. All students requesting accommodations for disabilities should be registered through A-State's Access and Accommodation Services (870.972.3964). If Access and Accommodation determines you should be able to take tests in their office, it is your responsibility to schedule the test for the same time and date as the exam is administered to other students.

   https://www.astate.edu/disability

3. Students should conduct themselves in respectful and courteous ways. Ways of being discourteous or disrespectful include but are not limited to: answering or using a cellular phone in class, using a computer for non-class related purposes, arriving late, leaving early without permission, asking excessive or off topic questions (but I greatly encourage reasonable and on topic questions).

   *Electronic device policy: Do not use cell phones in class. I expect cell phones to be put away and turned to silent (not vibrate). Only use laptops and tablets for class related purposes.

4. Do not take photographs of the white board during lecture, and do not record audio or video during lecture. From the student handbook, "viewing, transmitting, recording, filming, photographing, producing or creating a digital electronic file of the image or voice of another person, including classroom settings, without their knowledge, or consent" is deemed "non-academic misconduct". For more information, see the Student Handbook, pg. 68.

5. For 3000-level classes and above, attendance alone should not result in a failing grade but may be linked to grading factors such as class participation or in-class work.

6. I expect that all assignments will be completed on their respective due dates. The only exceptions are: 1) medical, with signed documentation from a doctor, 2) all University recognized holidays, 3) special events observed by organized religions (will be honored for those students who show affiliation with that particular religion), and 4) absences officially excused by the University. Airplane tickets, weddings, trips, and so forth, will not be excused. If you are unsure about a particular case, speak with me *before* a due date.

7. The due dates for **Paper 1** and **Paper 2** are nonnegotiable. In special circumstances I will allow one paper to be accepted past the deadline at a penalty of one letter grade per day late. What counts as a special circumstance is up to my discretion. If you are unsure about a particular case, speak with me *before* a due date.

8. Information on campus closure can be found on the A-State web page, on KASU, and on local radio and television stations. If inclement weather reasonably prevents you from being able to come to class and campus is not closed, please call or email me as soon as possible.

9. The best way to contact me is through University email. You are responsible for regularly checking your University email and the Canvas course page. Please use your A-State email account for all email correspondence. Please compose email correspondence thoughtfully and professionally.