

LIN/PSY/PHL 463-002 Introduction to Cognitive Science SS 2023

When: Monday & Wednesday, 2:40pm – 4:00pm

Where: Hubbard Hall G29

Professor: Dr. Jan Brascamp
282A Psychology Building
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Online information: D2L: SS23-LIN-463-002 - Introduction to Cognitive Science

Office Hours: By appointment. Psychology building 282A.

Course Description: Cognitive science is the interdisciplinary study of mind, whether mind is embodied in the biological stuff of neurons in a brain, or in the silicon stuff of computer chips in an artificial brain-like system. The creation of a successful scientific explanation of mind requires a concerted effort by investigators with many intellectual talents, from many different theoretical perspectives and empirical traditions, and across many different academic disciplines. This course provides an introduction to the interdisciplinary field of cognitive science, drawing on the perspectives and issues in the disciplines of psychology, philosophy, computer science, neuroscience, and linguistics.

Reading: The schedule below lists reading for each class day. Reading ahead of time is recommended. Much of the reading material comes from the textbook: *An Introduction to the Science of the Mind* (second edition) by Jose Luis Bermudez. Cambridge University Press. Acquiring the textbook is recommended but not required. Other reading is not from the textbook: that other material will be provided as PDF files via D2L. The reading materials for the special topics sessions (detailed below), will also be provided via D2L.

Other online materials: The slides of each lecture will be provided online via D2L, before the start of the lecture. A study guide will be provided via D2L ahead of each exam.

Attendance: You are expected to attend each class, and you are required to attend the two class sessions that are labeled 'special topic'. Attendance of the two 'special topic' sessions affects your grade; attendance of the other class sessions does not (but you're likely to do better on the exams if you attend).

Exams: There will be three exams: exam 1, exam 2, and exam 3. None of the exams will be cumulative: each exam will be about the material covered during the class sessions that happened since the previous exam. All three exams will be offered during regular class hours, before exam week. Each exam will consist of 30 multiple-choice questions, together worth 30 points.

Special topics: Throughout the semester there will be two special topics. In each case we will examine work of a philosopher who has written about the mind. In each case you will be given reading material about the philosopher's ideas via D2L, plus a set of questions about that material. In each case you will be required to turn in your answers to those questions by an assigned date, which is listed in the schedule below. In each case there will be a class session with required attendance, during which we will discuss your answers. Successful completion of both special topics is worth 30 points: you can earn 20 points for your answers to the questions surrounding the assigned reading materials (10 points for each of the two special topics; $2 \times 10 = 20$), plus 10 points for your attendance of the associated class sessions (5 points for each of the two special topics; $2 \times 5 = 10$). Timely submission and attendance does not guarantee full credit; shortcomings in your contribution can lead to partial credit being awarded.

Extra credit: There are several extra credit assignments, which will all be made available via D2L. Each assignment is worth a certain number of percentage points, as listed in the description on D2L. Students can complete as many extra credit assignments as they want, earning a maximum of 4% of extra credit. You can browse the options at your own leisure, and during lectures it will typically be mentioned if an extra credit option related to the day's topic exists.

Honors option: An honors option will be provided via email upon request.

Grade breakdown (out of 120):

Exam 1:	30
Exam 2:	30
Exam 3:	30
Special topic 1:	15 (10 for answers + 5 for attendance)
Special topic 2:	15 (10 for answers + 5 for attendance)

Tentative grading scale (might become more lenient; not more strict):

90½ % and above	4.0
86½ % and above	3.5
80½ % and above	3.0
76½ % and above	2.5
70½ % and above	2.0
66½ % and above	1.5
60½ % and above	1.0
Less than 60½ %	0.0

Course schedule:

Date	Title	Reading ('Book'=Bermudez book'; 'PDF'=PDF document on D2L)	Remarks
Jan 9	Introduction to the		

	course		
Jan 11	The birth of cognitive science 1	*Book: Chapter 1 introduction, 1.1, 1.3	
Jan 16	<i>No class: MLK Jr. Day</i>		
Jan 18	The birth of cognitive science 2	*PDF: 'enigma_bombe_turing' pages 1-7 (as marked in PDF)	
Jan 23	Turing and his Bombe	*PDF: 'enigma_bombe_turing' pages 27-31 (as marked in PDF)	
Jan 25	Turing and his Turing machines	*Book: 1.2 *PDF: 'scientificamerican_Turing' as marked in PDF	
Jan 30	Information processing 1: psychology	*Book: 1.4, 1.5	
Feb 1	Information processing 2: computers	*Book: Chapter 2 intro, 2.1	
Feb 6	The Physical Symbol Systems Hypothesis	*Book: Chapter 6 intro, 6.1 *Book: Chapter 7 intro, 7.1	
Feb 8	<i>Catch up and review for exam 1</i>		
Feb 13	Exam 1		Covers all lectures till this point
Feb 15	Representation, information processing and the brain 1	*Book: Chapter 3 intro, 3.1, 3.2 not including 'Two visual system hypothesis' *PDF 'neurons'	Answers for Feb 20's special topic due over email today
Feb 20	Special topic: Chinese room argument	*PDF: 'Bermudez Chinese room' *PDF: 'IEP Chinese room'	Attendance required; associated answers due over email by Feb 15
Feb 22	Representation, information	*PDFs 'retina to ganglion cells' and 'cortex simple cells'	No

	processing and the brain 2		
Feb 27	Representation, information processing and the brain 3		No
Mar 1	The integration challenge 1	*Book: Chapter 4 intro, 4.1, 4.2, 4.4, 4.5	
Mar 6	<i>No class: Spring break</i>		
Mar 8	<i>No class: Spring break</i>		
Mar 13	The integration challenge 2	*Book: 2.3 *Book: Chapter 5 intro, 5.1 *Book: 5.2 starting at p 124 'In one sense...'	
Mar 15	<i>Catch up and review for exam 2</i>		
Mar 20	Exam 2		Covers all lectures since exam 1
Mar 22	Neural networks and distributed information processing 1	*Book: 3.3 *Book: Chapter 8 intro, 8.1 *Book: 8.2 up to, not including 'Learning in single-layer networks ...'	
Mar 27	Neural networks and distributed information processing 2	*Book: 8.2 starting at 'Learning in single-layer networks ...'	
Mar 29	<i>No class: instructor absent</i>		
Apr 3	Neural networks and distributed information processing 3	*Book: 8.3 up to, not including 'How biologically plausible are neural networks'	
Apr 5	Comparing artificial neural networks to PSS and the brain	*Book: 8.3 starting at 'How biologically plausible are neural networks' *Book: 8.4'	
Apr 10	Dynamic systems 1	*Chapter 13 intro, 13.1	

Apr 12	Dynamic systems 2	*PDF 'beer' *Book: 13.2	
Apr 17	Consciousness	*Book: Chapter 14 intro, 14.1, 14.2 *Book: 14.5 up to and including p. 466 *PDF: consciousness	
Apr 19	<i>Catch up and review for Exam 3</i>		Answers for Apr 26's special topic due over email today
Apr 24	Exam 3		Covers all lectures since exam 2
Apr 26	Special topic: What is it like to be a bat?	*PDF: Nagel_bat	Attendance required; associated answers due over email by April 19

Some Course Rules

1.) Academic Honesty: Article 2.3.3 of the Academic Freedom Report states that "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." In addition, the Department of Psychology adheres to the policies on academic honesty as specified in General Student Regulations 1.0, *Protection of Scholarship and Grades*; the all-University Policy on *Integrity of Scholarship and Grades*; and Ordinance 17.00, Examinations. (See *Spartan Life: Student Handbook and Resource Guide* and/or the MSU Web site: www.msu.edu.)

Therefore, unless authorized by your instructor, you are expected to complete all course assignments, including homework and exams, without assistance from any source. You are expected to develop original work for this course; therefore, you may not submit course work you completed for another course to satisfy the requirements for this course. Also, you are not authorized to use the www.allmsu.com Web site to complete any course work in LIN 463. Students who violate MSU academic integrity rules may receive a penalty grade, including a failing grade on the assignment or in the course. Contact your instructor if you are unsure about the appropriateness of your course work. (See also <http://www.msu.edu/unit/ombud/dishonestyFAQ.html>)

2.) Accommodations for Students with Disabilities: Students with disabilities should contact the Resource Center for Persons with Disabilities to establish reasonable accommodations. For an appointment with a disability specialist, call 353-9642 (voice), 355-1293 (TTY), or visit MyProfile.rcpd.msu.edu.

3.) Drops and Adds: See <http://www.reg.msu.edu/ROInfo/EnrReg/Lateadds.asp> for information on last dates to drop or add this course. You should immediately make a copy of your amended schedule to verify you have added or dropped this course.

4.) Commercialized Lecture Notes: Commercialization of lecture notes and university-provided course materials is not permitted in this course.

5.) Class Attendance: Students are expected to attend every class session. Examinations are based on materials covered in class and in the assigned readings. However, not every element covered in class is also covered in the readings. Some elements covered in the readings are covered in different form in class. Students whose names do not appear on the official class list for this course may not attend this class. Students who fail to attend the first four class sessions or class by the fifth day of the semester, whichever occurs first, may be dropped from the course.

6.) Cell Phone and Laptop Policy: No use of cell phones is permitted during the lecture and all cell phone ringers must be turned off (without exception). Any use of laptops must be for course-relevant activities. If you violate the cell phone and laptop policy, you will be asked to leave the class.

7.) Disruptive Behavior: Article 2.3.5 of the *Academic Freedom Report* (AFR) for students at Michigan State University states: "The student's behavior in the classroom shall be conducive to the teaching and learning process for all concerned." Article 2.3.10 of the AFR states that "The student has a right to scholarly relationships with faculty based on mutual trust and civility." General Student Regulation 5.02 states: "No student shall . . . interfere with the functions and services of the University (for example, but not limited to, classes . . .) such that the function or service is obstructed or disrupted. Students whose conduct adversely affects the learning environment in this classroom may be subject to disciplinary action through the Student Faculty Judiciary process.