Lin 463-001 Introduction to Cognitive Science Fall 2017

When: Monday & Wednesday, 4:10pm – 5:30pm
Where: A128 Wells Hall
Professor: Dr. Jan Brascamp
282A Psychology Building
brascamp@msu.edu
Online information: D2L: FS17-LIN-463-001- Intro 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, linguistics, neuroscience, and computer science.

Required Textbook: Cognitive Science: An Introduction to the Science of the Mind (second edition) by Jose Luis Bermudez. Cambridge University Press

Additional reading: Some of the required reading is not from the book but from other materials that will be provided via D2L.

Online lecture materials: The slides of each lecture will be provided online via D2L.

General Expectations: You are expected to attend each lecture, complete the assigned readings prior to lectures, actively participate in class discussions, and complete all course requirements.

Quizzes: It is essential that you familiarize yourself with the assigned reading before each class. For this reason there will be 7 unannounced 6-question multiple-choice quizzes. These quizzes will test factual knowledge about the content of the assigned readings, and they will also assess your attendance because a missed quiz will result in a 0. Quizzes will be worth 6 points each with the grade for the lowest quiz dropped (the maximum total score across all quizzes is 36 points).

Exams: There will be two exams: a midterm and a final. Each exam will consist of 16 multiple-choice questions, together worth 16 points, as well as 4 essay questions, each worth 5 points (20 points together). The multiple-choice questions will be like the quizzes, and they will focus on factual knowledge about the course material.

Understanding the essay questions will obviously require factual knowledge as well, but the emphasis will be on integrating, and actively thinking about, this material. The essay questions will be similar to in-class exercises that are part of the lectures, so active participation in those exercises is a good idea.

Group project: Students will be split into 7 groups of 5 or 6 students each. Each group will be assigned a text that provides background to lecture material, as well as associated questions. Each group will have a meeting with Dr Brascamp about their progress on the assignment, will present their results in class, and will hand in a text of close to 2 pages that documents their work. Each group member's grade on the group project is made up of three parts: 1/3 (16 points) is for the group's presentation; 1/3 (16 points) is for the group's written text; and 1/3 (16 points) is the average grade given to each individual group member by the other group members. This final component is meant to address the possibility of having 'slackers' and 'drivers' in a group. Further details about the group projects will be provided in a separate document.

Grade breakdown (out of 192):

Quizzes:	36
Midterm exam:	36
Final exam:	36
Group project	36

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	Topic	Assigned reading (B=Bermudez)	Bring laptop?
Wed 8/30	Introduction to the course		
Mon 9/4	*No class*		
Wed 9/6	Prehistory of the field 1	*B: Chapter 1 intro, 1.1, 1.3	Yes
Mon 9/11	Prehistory of the field 2	*B: 1.2, 1.4, 1.5 *PDF	Yes

		'scientificamerican_Turing' as marked in PDF	
Wed 9/13	Becoming more familiar with algorithmic processing and representations	*B: Chapter 2 intro, 2.1, 2.2, and starting p. 423: 'The challenge of building a situated agent'	Yes
Mon 9/18	The physical symbol system hypothesis 1	*B: Chapter 6 intro, 6.1 *B: Chapter 7 intro, 7.1	
Wed 9/20	The physical symbol system hypothesis 2	*B: 7.2, 7.3 *PDF 'funt_paper': abstract, paragraphs 2.1, 2.2 as marked in PDF, 3.1	
Mon 9/25	*Student presentation 1* + The physical symbol system hypothesis 3	*PDF 'logic': sections 1 and 1.1 *B: 6.2, 7.4	
Wed 9/27	*Student presentation 2* + Representation, information processing and the brain 1	*B: Chapter 3 intro, 3.1, 3.2 not including 'Two visual system hypothesis' *PDF 'neurons'	
Mon 10/2	Representation, information processing and the brain 2	*PDFs 'retina to ganglion cells' and 'cortex simple cells'	
Wed 10/4	*Student presentation 3* + Representation, information processing and the brain 3	*PDF 'color vision'	
Mon 10/9	The integration challenge 1	*B: Chapter 4 intro, 4.1, 4.2, 4.4, 4.5	
Wed 10/11	*Student presentation 4* + The integration challenge 2	*B: 2.3 *B: Chapter 5 intro, 5.1 *B: 5.2 starting at p 124 'In one sense…'	
Mon 10/16	*Student presentation 5 + Review for midterm exam*		
Wed 10/18	*Midterm exam*		
Mon 10/23	Neural networks and distributed information processing 1	*B: 3.3 *B: Chapter 8 intro, 8.1 *B: 8.2 up to, not including 'Linear separability and …'.	Yes
Wed 10/25	Neural networks and distributed information processing 2	*B: 8.2 starting at 'Linear separability and …' *B: 8.3	
Mon 10/30	Neural networks and distributed information processing 3	*B: 8.4 *B: Chapter 9 up to and including 9.2 except 'Language learning and the	

		language of thought…' *PDF: 'mclelland_model' *B: 9.3 except p 257-259 *B: 9.4 up to, not including 'Modeling object permanence'	
Wed 11/1	Comparing the physical symbol system hypothesis and neural networks	*B: 9.5 up to, not including 'But, Fodor and Pylyshyn continue' on p 270. *PDF 'connectionism' *B: 10.4	
Mon 11/6	A third option? Dynamic systems 1	*Chapter 13 intro, 13.1 *PDF 'beer'	Yes
Wed 11/8	A third option? Dynamic systems 2	*B: 13.2 up to, not including, 'Assessing dynamic systems approach.' *PDF 'beer_2'	
Mon 11/13	Modularity and architectures 1	*B: Chapter 10 intro, 10.1, 10.2 *B: 10.3 up to p 296 'Many different types'.	
Wed 11/15	*Student presentation 6* + Modularity and architectures 2	*B: Chapter 11 intro, 11.1, 11.2	
Mon 11/20	Modularity and architectures 3: subsumption architectures	*B: 13.4 up to, not including, 'Behavior-based robotics: TOTO' *PDF: 'brooks'	
Wed 11/22	*No class. Thanksgiving*		
Mon 11/27	A different take on intelligence: situated cognition and biorobotics	*B: 13.3 up to p. 427 'The morphological computation movement' *PDF: webb *B: 13.4 section 'Behavior-based robotics: TOTO' up to 'One of TOTO's key features' *B: 13.4 section 'Multi-agent programming: The Nerd Herd'	
Wed 11/29	The cognitive science of consciousness 1	*B: Chapter 14 intro, 14.1, 14.2 *B: 14.5 up to and including p. 466 *PDF: consciousness	

Mon 12/4	*Student presentation 7* + The cognitive science of consciousness 2	*B: 14.3, 14.4 except section 'Milner and Goodale …' *B: 14.7	
Wed 12/6	*Review for final exam*		
Final Exam: A128 Wells Hall, date and time TBA.			

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.