Syllabus: Introduction to Cognitive Science CGS2301.001

Course Information

Course Number/Section	CGS2301.hn1
Course Title	Introduction to Cognitive Science
Term	Spring 2024
	Tues-Thurs 10-11:15am (HH 2.706)

Professor Contact Information

Professor	Dr. Alice J. O'Toole
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Office Location	GR4.224
Online Office Hours	by appointment

Course Pre-requisites, Co-requisites, and/or Other Restrictions

None.

Course Description

This course is an introduction to the study of the brain and behavior from the point of view of cognitive science, including approaches from psychology, philosophy, neuropsychology, and computational modeling. Phenomena involving sensory systems, memory, decision making, language, and communication are discussed.

Student Learning Objectives/Outcomes

After completing the course, students should be able to:

1. Describe and explain the nature of the relevant psychology and cognitive science-related fields and scientific disciplines.
2. Describe and analyze major theoretical perspectives and overarching themes of psychology and other cognitive science-related fields and discuss their historical development.
3. Locate, accurately summarize, and evaluate bodies of scientific literature in psychology.
4. Use critical thinking to evaluate scholarly literature.
5. Describe basic components of the laws of nature as developed in the various scientific courses in the core program.
6. Set up scientific problems in feasible and solvable ways as illustrated in the various subjects in the core curriculum.
7. Make reasoned arguments about major issues of a scientific nature.

Required Textbooks and Materials

The readings and a study guide are available on eLearning.

Suggested Course Materials

N/A

Assignments & Academic Calendar

Class Dates	Lecture Topic (approximate)	*Reading to be discussed*
Jan 16	Business and Introduction	
Jan 18	History of Cognitive Science	R1- brain electric
Jan 23	Methods in Neuroscience	R2- new connections
Jan 25		R3a- neuro-prosthetic video
Jan 30	Brain Structure	R3b- neuro-prosthetic video
Feb 1	Mind and machine	R4-history of brain stimulation
Feb 6		R5-brain white matter and learning
Feb 8		R6-cerebellum
Feb 13	Real & Artificial Neural Networks	R7-Turing and neural networks
Feb 15	Hemispheres of the Brain	R8- split brain
Feb 20	Seeing and perceiving	R9- blind sight
Feb 22		
Feb 27		**Exam 1**
Feb 29		R10-language evolution
Mar 5	Audition and Speech	R11- sign language in the brain
Mar 7		R12 – sleep memory
Mar 12-15	Spring break	
Mar 19		R13- superior autobiographical memory
Mar 21	Language	R14- teen brain
Mar 26	Memory	R15 - survival of the friendliest
Mar 28		R16 – artificial imagination
Apr 2		R17 – AI Mystery
Apr 4		**Exam 2**
Apr 9	Judgment, decision-making	R18 – ChatBots Talking R19 – AI's IQ R20 – AI dangers to society
Apr 11		R21 - science of non-scientific thinking
Apr 16		R22 - attention economy
Apr 18	Emotion	R23 - new world disorder
Apr 23		R24 - Freud returns
Apr 25	Consciousness	R25 - consciousness
Apr 30		Exam review
May 3		**Exam 3 (May 7)**

Exam 1

R1 Koch, C. The brain electric. *Scientific American*, June, 2021, 71-75.

R2 Frey, S.H., New connections. *Scientific American*, December, 2020, 61-69.

R3a Will a robotic arm ever have the functionality of a human hand? *PBS NewsHour Report, Science Correspondent Miles O'Brien.*

R3b Can modern prosthetics actually help reclaim the sense of touch? *PBS NewsHour, Science Correspondent Miles O'Brien.*

R4 Hogan J. The forgotten era of brain. *Scientific American*, Oct., 2005, 66-73.

R5 R. D. Fields, The brain learns in unexpected ways. *Scientific American*, March, 2020, 75-79.

R6 Bower, J. & Parsons, L. Rethinking the lesser brain. *Scientific American*, August, 2003, 49-57.

R7 Copeland, B. J. & Proudfoot, D. Alan Turing's forgotten ideas in computer science. *Scientific American*, April, 1999, 99-103.

R08 Gazzaniga, M. The split brain revisited. *Scientific American,* July, 1998, 50-55.

R09 De Gelder, B. Uncanny sight in the blind. *Scientific American*, May, 2011, 60-65.

R10 Kineally, C. What makes language distinctly human**.** *Scientific American,* Sept, 2018, 55-59.

R11 Hickok, G., Bellugi, U. Klima, E. Sign language in the brain. *Scientific American,* June, 2001, 57-65.

R12 Paller, K. A. & Uudiette, D. Sleep learning gets real. *Scientific American*, Nov., 2018, 27-31.

R13 McGaugh, J., LePort, A., Remembrance of all things past. *Scientific American*, February, 2014, 41- 45.

R14 Geidd, J. N. The amazing teen brain. Scientific American, April 2023, 31-37.

R15 Hare & Woods (2020). Survival of the friendliest. *Scientific American,* August, 58-63

R16 Musser, G. (2019). Artificial Imagination. *Scientific American,* May, 58-63

R17 Musser, G. (2023). How AI Knows Things No One Told It. *Scientific American,* May, 58-61

R18 Miceli, G. (2023). ChatBots Talking. *Scientific American,* May, 68-71

R19 Roivainen, E. (2023) AI's IQ. *Scientific American,* July-Aug 7.

R20 'Godfather of AI' on dangers technology poses to society.

https://www.pbs.org/video/the-future-of-ai-1683317973/

R21 Kenrick, D.T., Cohen, A, B., Neuberg, S.L. & Chialdini, R. B. The science of anti-science thinking. *Scientific American,* July, 2018, 38-43.

R22 Menczer, F. & Hills, T. The attention economy. *Scientific American*, Dec. 2020.

R23 Wardle C. (2019). A new world order. *Scientific American*, September, 2019, 88-93.

R24 Solms, M**.** Freud returns. *Scientific American*, May, 2004, 83-89.

R25 Koch C. (2019). Proust among the machines. *Scientific American*, December, 2019, 46-49.

Exams and Assignments:

Exams: There are three non-cumulative exams based on the lectures and reading. Material from lectures and readings will be included on each exam. Approximately 70% of the points on each exam will be based on the lectures. The remainder of points will test your knowledge and understanding of the readings.

***Homework*.** Homework consists of pass-fail study guides on the readings, due on the date of article discussion (see calendar page of syllabus). NO CREDIT will be given to homework not handed in *by the deadline* posted on the e-learning website. This will always be **midnight of the day before** the article is discussed in class. I have set up a hand-in assignment item for each reading on e-learning.

NOTE: Students are responsible for all material presented in class, including directives about exams. There is no assigned book for the class, and so missed materials from class lectures cannot be obtained from readings.

Presentation: Each student is required to present one of the assigned articles to the class. Details will be given in class.

Attendance: Attendance will be evaluated as follows: If you attend more than 80% of the classes, you will get all 10 points for attendance; between 60-79% of classes, 6 points; between 40-59%, 4 points; 20-39% 2 points; less that 20%, 0 points.

Research Requirement. One requirement of all students enrolled in this class is completion of two research exposure credits. This requirement provides students practical and direct experiences with research and is an important means to understanding behavioral research. Details about this requirement appear on the separate Research Exposure Credit Requirement handout distributed on the first day of class or posted on the course eLearning page.

Failure to complete the research exposure requirement will result in lowering your total grade in this class. For each Research Exposure Credit you fail to complete, your course grade will be reduced by 1/3 letter grade. For example, if you only complete one of the two required credits and your grade for all other course requirements is an A+, then your grade would be lowered from an A+ to an A. If you do not complete both credits, your grade would be lowered from an A+ to A-. The deadline for completion of these credits is found on the REC instruction sheet.

Grading Policy

Grading: 90% correct for A's, 80% for B's, 70% for C's, 60% for D's. I reserve the right to alter these criteria based on the grade distribution. Grades will be based on the total number of points across the course. Exam 1 counts as 20% of the grade, Exams 2 and 3 count for 22.5% (each) of the grade. The presentation will contribute 15% to the grade. Each homework will contribute 10% to the grade Attendance will count as 10%. (See also research requirement).

Course & Instructor Policies

DON'T MISS AN EXAM! Make-up exams will be given only if:
(a) you were ill and have verifiable documentation from a physician, or (b) you were detained the day and time of the exam, or (c) you made arrangements prior to the exam to attend an urgent family affair. In any of these cases, you must notify the professor or TA in advance of the scheduled time of the exam (call and leave a voice-mail message if you can do nothing else).

Class Materials

The instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course, however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Attendance

Attendance: Attendance will be evaluated as follows: If you attend more than 80% of the classes, you will get all 10 points for attendance; between 60-79% of classes, 6 points; between 40-59%, 4 points; 20-39% 2 points; less that 20%, 0 points.

Class Participation

Regular class participation is expected. Students who fail to participate in class regularly are inviting scholastic difficulty. A portion of the grade for this course is directly tied to your participation in this class. It also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by faculty. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Recordings

Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

The instructor may record meetings of this course. These recordings will be made available to all students registered for this class if the intent is to supplement the classroom experience. If the instructor or a UTD school/department/office plans any other uses for the recordings, consent of the students identifiable in the recordings is required prior to such use unless an exception is allowed by law.

Off-campus Instruction and Course Activities

N/A

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

Academic Support Resources

The information contained in the following link lists the University's academic support resources for all students.

Please see http://go.utdallas.edu/academic-support-resources.

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please review the catalog sections regarding the credit/no credit or pass/fail grading option and withdrawal from class.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.