

Introduction to Cognitive Science
COGST 1101/CS 1710/LING 1170/PHIL 1910/PSYCH 1102

Spring 2023, TENTATIVE Syllabus
Tuesdays and Thursdays, 9:40am-10:55am
Meeting in Person

THIS SYLLABUS IS TENTATIVE AND WILL CHANGE BEFORE JANUARY 2023

Instructor Information

Instructor: Professor Khena M. Swallow
Office: 230 Uris Hall
Office Hours: Thurs 11am-12pm, Fri 9-10am, and by appointment
Email: KMS424@cornell.edu

Teaching Assistants

Office Hours	
TBD	TBD

Course Information

Course Email: TBD
Course Website: canvas.cornell.edu

This course will be taught in person. Without the WIM section (see below), this course is for three credits. The course can be taken for a letter grade or S/U. There are no pre-requisites for this course.

We will use the Canvas course website for all aspects of this course. Please check Canvas regularly for announcements, updates to this syllabus, assignments and due dates, office hour information, readings, grades, and any other updates to the course.

Please use the course email to get the fastest response to your questions – it will be monitored by all the TAs and the instructor. You can expect a response by the end of the next business day.

This Course and its Goals

Cognitive Science investigates the mechanisms involved in perceiving, thinking, and acting. Though young as a science, the questions that cognitive science seeks to answer are old, familiar, and reflect the integrated nature of minds, bodies, and environments. It is for these reasons that cognitive science is a truly interdisciplinary endeavor. It draws on and integrates five disciplines: *Philosophy*, which provides insight into the nature of the questions themselves; *Psychology* and *Linguistics*, which investigate the functions of the mind; *Neuroscience*, which describes the physical bases of the mind; and *Computer Science*, which explores the ways that minds can be constructed. This course will introduce you to the insights that each discipline offers to understanding the mind, what current scientific approaches to the mind can tell us about what it does and how it does it, and emerging issues and approaches to the study of the mind and its physical and conceptual boundaries.

Goals. The primary goal of this course is for you to think about and understand the mind from a scientific perspective. By the end of this course you should be able to:

- (1) describe and contrast the major views on the relationship between minds, brains, and the body;

- (2) describe and contrast several theoretical approaches to cognition, including rule-based approaches, artificial neural networks, and situated cognition;
- (3) identify major insights cognitive science offers into visual perception, attention, memory, learning, language, comprehension, action, and consciousness;
- (4) summarize how philosophy, psychology, linguistics, neuroscience, and computer science contribute to and broaden our understanding of cognitive science;
- (5) explain several empirical approaches cognitive scientists use to discover the machinery of the mind and brain. Thus, this course's emphasis is not just on *what* we know (and don't know) about the mind, but also on *how* cognitive scientists study it.

Writing in the Majors (WIM)

This course has an optional WIM section (1 additional credit) that will be led by a graduate student (TBD). The WIM section is a unique opportunity for students to learn about cognitive science in a seminar-like setting. Students enrolled in this section will more deeply explore select topics from this course through additional readings, writing assignments, and weekly discussions (discussion will be held during an extra 50-minute long weekly meeting, timing TBD). The grade from these assignments replaces two of the exams in the main course and the homework (or 50% of the final grade). Students in the WIM section therefore need to take only two exams (though they can take all of them if they choose). The syllabus for the WIM section is available on the course website. Students who are interested in enrolling in the WIM section should contact the graduate student leading the section.

Readings

This course uses Bermúdez (2020). *Cognitive Science: An Introduction to the Science of the Mind*, 3rd Ed. from Cambridge University Press. Please note that the two earlier editions will not have all of the assigned readings in them, so *only the third edition of this book is recommended*. Other readings will be posted on the course web page.

The lectures will cover some of the material in the assigned readings, and the structure of the class does not correspond directly to the structure of the book. The lectures will also include additional material, demonstrations, and opportunities for you to think through some of the issues that are central to cognitive science. Exams will cover the readings and the lectures. You are encouraged to complete all of the assigned readings and to attend each class meeting (see Participation and Quizzes section).

Office Hours and Contacting the Instructor and TAs

We would love to talk to you during office hours! These are a great time to let us know how things are going, to discuss course material, and get help with questions, particularly those that require an in-depth response. If you are unable to come to office hours please let us know.

To facilitate better interactions, you will need to sign up for a particular TA on Canvas before the first exam. You should choose a TA whose office hours are compatible with your schedule. If you want to email one of us please use the course email address (TBD) for faster responses. You can expect a response by the end of the next business day.

Course Requirements

Your final grade will be determined by your performance on four exams, three homework assignments, and class participation and quizzes. Extra credit opportunities will be available throughout the semester. You are expected to check your grades regularly to ensure your work has been received and grades are accurately recorded. Please note that you should not rely on Canvas' estimates of your final grade, as it may not reflect the grading structure described in this syllabus.

Exams (70%). To encourage frequent study and reduce the stress associated with taking exams, there will be a total of five exams throughout the semester. As a result, each exam will cover less material, will be shorter, and will be worth a smaller percentage of your grade than if there were fewer exams. Four of these exams will be preliminary and will be completed during the scheduled class time. Preliminary exams for this class therefore are not evening preliminary exams and do not conflict with exams for other courses. These will focus on material covered since the previous exam (or beginning of the semester). The fifth exam will be a cumulative final exam. Your four highest exam scores will be used to determine your final grade (meaning that each exam will account for 17.5% of your final grade). The lowest exam score won't count. If you are completely happy with your scores on the four preliminary exams you do not need to take the final. If you miss one of the preliminary exams, you can take the final exam as a make-up exam. Because of this, there will be no other makeup exams except in the case of an unusual need (e.g., a documented illness). I strongly encourage you to take all four preliminary exams. Exams will be primarily multiple choice, but will include some short answer/essay questions. Exams will cover material from lectures, readings, assignments, and videos shown in class.

Review sessions will be offered prior to each exam. Once the exams are graded, we will also hold special office hours to go over common mistakes. You also can set up an appointment to review an exam with one of us. However, any requests for a regrade must be received within two weeks of the date that exam grades were posted. A regrade request will cause all answers to be regraded, and could result in a lower grade.

Participation and Quizzes (15%). One of the many things cognitive science has taught us is that learning is enhanced by both engagement and testing. In fact, if you want to remember something you just learned, testing your memory is more effective than studying it again. So, for each class meeting you will earn points based on your responses to in-class questions and activities using Poll Everywhere. Responding to a question will earn you one point and Poll Everywhere questions can occur at any time during the 75 minute class meeting. In-class questions will not be graded for accuracy – simply responding to the question will be sufficient to earn points. Additional participation points may sometimes be assigned for out of class activities. The first two are signing up for a TA on Canvas and introducing yourself to your TA or to Prof. Swallow during office hours before the first preliminary exam (i.e., by the end of the day, TBD).

Except for weeks when there is an exam, at the end of every week there will also be an optional and brief (< 10 minutes) online quiz on topics covered that week in class or in the readings. Quizzes will be available to complete for points for a 24 hour period, either the Friday or Saturday (the class will vote for which one they'd prefer). However, quizzes will remain available for study or practice after they are due. These usually will be multiple choice questions or fill in the blank questions and your responses must be correct to earn the points. Quizzes will be on the assigned reading and material from lectures. Quizzes will provide you with an additional opportunity to study and practice the material. Points from the quizzes also can be used to make up for missing in-class participation points if any were missed. There is no guarantee that there will be as many quiz points as in-class participation points, so never attending class and taking the quizzes only may not be sufficient to earn full credit for this part of your grade.

At the end of the semester, your participation and quiz grade will be based on the total points you earned from participation and quizzes divided by the total possible points from the participation points only (max 100%). Thus, completing the quizzes can increase your grade, but missing them won't hurt you. Also, you can make up points from a missed class by completing the quizzes.

Students needing accommodations for a missed class should contact the instructor and their TA as early as possible and before the missed class.

Homework Assignments (15%). There will be three homework assignments. The assignments will be announced on the course website and during class. You will have at least 1 week to complete them. Final grades on assignments will be reduced by 10% for each day they are late, including weekends, for a maximum deduction of 50%. *Important: You are responsible for ensuring that your homework was successfully submitted -- check at least twice to make sure your homework was received.*

Extra Credit. There will be several opportunities for extra credit. Extra credit can add as much as (and no more than) 5% to your final grade. For example, if at the end of the semester you have earned a final grade of 90% and you complete the maximum amount of extra credit (5%) then you will receive an A in the course (95%). You can earn extra credit (5% maximum) with any combination of the following options (also listed on the course website).

Option 1: Experiment Participation. You can earn SONA credits by volunteering to participate in experiments through the Psychology Department's SONA website (cornellpsych.sona-systems.com). Experiments can be online or in person. For every half-hour you spend in an experiment you will earn 1 SONA credit. Each credit adds 0.5% to your final grade. SONA credit can be earned up to the day of classes, and must be completed by that date (i.e., it is not enough to have signed up for the study). *However, you should start early - students often have difficulty finding open appointments at the end of the semester.* If you choose to earn extra credit through SONA, please note that you will only receive credit for studies that have been approved for this course. The study's description on SONA will have a list of the classes it is eligible for, so make sure this class is listed before signing up. Please read the fact sheet available on the course website before signing up for studies.

Option 2: Written Report. Write a brief report on any of the following and email it to your TA (1 report = up to 1% added to your final grade):

- a. a colloquium talk related to cognitive science. Colloquia that are eligible for credit will be announced in class. However, most of the Psychology, Cognitive Science, and Linguistics colloquia will work. You can find links to the schedule for these on Canvas. You can write up to 3 of these reports. They should be 1 page, double-spaced.
- b. an item (e.g., painting, sculpture, archeological artifact) from a local museum (e.g., the Johnson Museum, the Sciencenter, or Museum of the Earth) describing how it relates to principles covered in this course. These papers should demonstrate your understanding of those principles. Reports should be 2 pages, double-spaced, and should include a picture of the item. You can write up to 2 of these.
- c. a critique of a popular press report on new findings in cognitive science. These should be on articles that appeared within the last three months and are clearly related to topics covered in this class. The critique can identify ways the science could be better characterized or discuss how topics covered in class are related to the findings (they may offer alternative interpretations, support, contradict, or be contradicted by the new data). Critiques should be 2 pages, double-spaced. You can write up to 3 of these.

These options are also described on the course website. Additional opportunities may be posted there as the semester progresses. *Each paper is graded* and can earn up to 1% extra credit.

Colloquia extra credit papers are due within 2 weeks of the event. Museum or popular press reports must be submitted by the last day of this class (TBD). Extra credit papers should be emailed to your TA.

Grading Scale: A standard grading scale will be used to determine your letter grade at the end of the semester. A grade corresponding to a C- or better ($\geq 70\%$) is required for an S on the S/U grading scale. Letter grade cut-offs are firm. Grade percentages will be rounded to the second decimal (i.e., 89.99 is a B+).

	F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A	A+
Min	0	60	63	67	70	73	77	80	83	87	90	93	97
Max	59.99	62.99	66.99	69.99	72.99	76.99	79.99	82.99	86.99	89.99	92.99	96.99	100

Need Help or Accommodations?

We are committed to full inclusion in education for everyone and want to ensure that all students have the opportunity to do well in this class. We want to help you succeed! If you need an accommodation due to a disability, find you are having difficulty keeping up with the class, feeling overwhelmed, or are worried about a friend, please reach out to one of us or your academic advisor. We can try to help or we can put you in touch with someone who can help.

Some resources that might be of use include:

- Office of Student Disability Services: <https://sds.cornell.edu>
- Learning Strategies Center: <http://lsc.cornell.edu/>
- Empathy, Assistance, and Referral Service (EARS): <https://www.earscornell.org/>
- Cornell Health CAPS (Counseling & Psychological Services):
<https://health.cornell.edu/services/counseling-psychiatry>
- Let's Talk: <https://health.cornell.edu/services/mental-health-care/lets-talk>
- Undocumented/DACA Student support: See the list of campus resources at
<https://dos.cornell.edu/undocumented-daca-support/undergraduate-admissions-financial-aid>

Students with Disabilities. Please give me your Student Disability Services (SDS) accommodation letter so I can arrange for your approved academic modifications. If you need an immediate accommodation, please speak with me in office hours or send an email to me and/or SDS at sds_cu@cornell.edu. If the need arises for additional accommodations during the semester, please contact SDS.

Academic Integrity

Each student in this course is expected to abide by the Cornell University Code of Academic Integrity. This can be found at <https://theuniversityfaculty.cornell.edu/academic-integrity/code-of-academic-integrity/>. By submitting your work for academic credit, you are affirming that it is your own. *If you have any questions about what constitutes a violation of the Academic Integrity Code, please ask us.*

Turnitin Notice. Students agree that by taking this course, all required papers may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Turnitin has identified papers from students who have

copied portions of the text, work from friends (including those who took the course previously), and online sources. These students have consequently faced charges of academic misconduct. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site.

Notice of copyright and prohibition against buying or selling course materials

The materials posted to Canvas and the materials the students in this class and the instructors create, including this syllabus, slides, rubrics, etc., are copyrighted and remain the intellectual property of their authors. These materials should not be distributed, either freely or for payment, without the express permission of the author. Distributing course materials in violation of this copyright constitutes academic misconduct.

This means that you are prohibited from buying and selling course materials through internet sites such as Chegg, CourseHero, and Slader. If you **buy** or otherwise access course materials through such a vendor, you face a charge of "Unauthorized Assistance," thereby violating the *Code of Academic Integrity*. Please note that Cornell faculty are able to trace posts from internet sites, including identifying the individuals who provide the original posts and those who read or download the posts. At various junctures during the course, I intend to monitor such sites.

Remember, too, that materials for sale may contain errors. There have been occasions when students have done poorly on exams and/or their unauthorized use of purchased work was discovered because the materials they purchased contained errors.

If you **sell** course materials, even your own class notes summarizing lectures, without my authorization, you are subject to a charge of "Academic Misconduct." You may also be participating in copyright infringement. Original course materials are intellectual property that belong to the author and are not a student's property to sell.

The Plan

Some topics will span multiple days, may start a bit earlier or later than scheduled, and could come up repeatedly throughout the semester. Meetings will be 9:40a.m. – 10:55a.m. Tuesdays and Thursdays.

Day	Topic	Reading
24-Jan	Tu	What it's all about
26-Jan	Th	Historical Context
31-Jan	Tu	The Emergence of Cognitive Science
2-Feb	Th	Information Processing
7-Feb	Tu	Information Processing
9-Feb	Th	Physical Symbol Systems
14-Feb	Tu	Problem Solving
16-Feb	Th	<u>Preliminary Exam 1</u>
21-Feb	Tu	Brain Structure & Function
		Bermúdez Ch. 9 (p. 229-241) *Verstynen & Voytek Ch. 1
23-Feb	Th	Neural Systems
28-Feb	Tu	February Break - No Class
2-Mar	Th	Attention
7-Mar	Tu	Memory Systems
9-Mar	Th	Artificial Neural Networks
		Homework 1 Due
14-Mar	Tu	Vision
16-Mar	Th	Vision
21-Mar	Tu	<u>Preliminary Exam 2</u>
23-Mar	Th	Intro to Linguistics+
28-Mar	Tu	Language Acquisition
30-Mar	Th	From Words to Models: Speech+
4-Apr	Tu	Spring Break - No Class
6-Apr	Th	Spring Break - No Class
11-Apr	Tu	From Words to Models: Concepts
13-Apr	Th	From Words to Models: Comprehension
		Homework 2 Due
18-Apr	Tu	<u>Preliminary Exam 3</u>
20-Apr	Th	Minds and Bodies
25-Apr	Tu	Minds and Bodies
27-Apr	Th	Dynamical Systems
2-May	Tu	Situation Cognition
4-May	Th	Consciousness
		Homework 3 Due
9-May	Tu	<u>Preliminary Exam 4</u>
		Extra Credit Papers Due**
		Barrett Ch. 6 Bermúdez Ch. 6 Bermúdez Ch. 16 Bermúdez Ch. 15 (p. 379-396) *Godfrey-Smith, Ch. 4

TBD	TBD	<u>Final Exam (Cumulative) TBD</u>	Review All
SONA credits due day before			

⁺Guest Lecture

^{*}Optional (but fun!)

^{**}Some extra credit papers may be due earlier; check the syllabus for more info