

COGS 1001-401 202230 Introduction To Cognitive Science

Course Syllabus

This syllabus is something of a ‘living document’, i.e., I may make changes. If I make important changes, I will announce them over canvas.

1. Overview of the Course

This course is about the scientific study of the mind: what it’s like, how it works, and how it’s generated by the complex organization of simpler kinds and processes (for example, neural and computational processes). We survey a wide range of views and approaches, with special attention on computational approaches. Topics include perception, development, the brain, concepts, language, reasoning, and more. Note that because of the nature of the course, we will cover a broad range of topics but not delve into great depth on any one topic.

This course is split between asynchronous and synchronous components. Asynchronous components include homeworks, readings, exams, and participating in the discussion forum (Ed Discussion in Canvas). The synchronous component includes attending lecture and recitations. These components are described further below.

1.0 Schedule

Week	Date	Agenda	Academic Calendar & Notes
1	30-Aug	Introduction	
	1-Sep	Cognitive Revolution and the Computational Theory of Mind	
2	6-Sep	Modularity	
	8-Sep	Models of computation	HW1 released
3	13-Sep	Probabilities in cognition	Course selection period ends

	15-Sep	Statement logic	HW2 released
4	20-Sep	Judgment and Decision-Making: Are we 'good' at reasoning?	HW1 due
	22-Sep	Judgment and Decision-Making: Behavioral Economics	
5	27-Sep	Take home Midterm (released Tues 1:45, due Thurs 1:45) 1.5hr to complete	HW2 due Sept 28, 11:59pm
	29-Sep	Language structure	
6	4-Oct	Language comprehension	
	6-Oct	FALL BREAK - NO CLASS	
7	11-Oct	Guest lecture from graduate TA Caroline Beech (topic TBA)	HW3 released; Drop period ends Oct 10
	13-Oct	Language and thought	
8	18-Oct	CLASS CANCELED	
	20-Oct	Neuroscience 1 - Basic structure and function	HW3 due
9	25-Oct	Neuroscience 2 - Methods	
	27-Oct	Neuroscience 3 - Plasticity	

10	1-Nov	Take home Midterm (released Tues 1:45, due Thurs 1:45) 1.5hr to complete	
	3-Nov	Cognitive Development	
11	8-Nov	Reinforcement Learning	Election day! Last day to withdraw Nov 7
	10-Nov	Neural networks 1	
12	15-Nov	Neural networks 2	HW 4 released
	17-Nov	Concepts and categories 1	
13	22-Nov	Concepts and categories 2	HW 4 due
	24-Nov	Thanksgiving - No class	
14	29-Nov	Number cognition	HW 5 released
	1-Dec	Collective cognition and behavior	
15	6-Dec	Evolution & wrap-up	HW5 due
	8-Dec	No class. Class time used for office hours (mid-term review, and/or COGS advising)	
16	13-Dec	No class - Classes end Dec 12	Ed Discussion screenshots due today
		Take home Midterm	1:45pm 12/14 to 1:45pm 12/16

1.1 Class Time and Location

The class's scheduled meeting time is Tuesday and Thursday at 1:45-3:15 pm EST, in Stiteler Hall B6.

2 Instructors and TAs:

Instructor:

Dr. Russell Richie

Associate Director of Cognitive Science & MindCORE

<https://drussellmrchie.github.io/>

[Links to an external site.](#)

drrichie@sas.upenn.edu

Office Hours:

These are my office hours *for this class*. I have separate office hours for major/minor advising, which you can find [here](#)

[Links to an external site..](#)

In person: Tuesday 9:30am to 11am in Goddard 203.

Virtual: Wednesday 9:30am to 11am on [Zoom](#)

[Links to an external site..](#)

By appointment (9-5, M-F): Find a time on my [calendar](#)

[Links to an external site..](#)

Head TAs:

Caroline Beech

Psychology, PhD 2025

Cognitive Science, Math, French and Francophone Studies, B.A., 2020, Vassar College

cbeech@sas.upenn.edu

Talia Boyajian

Instructor office hours will begin on September 5, and TA office hours on September 12, at the times and places for the instructors and TAs posted above.

The recitation time, location, and leader TAs can be found in the table below.

Sec	Day	Time	Room	Masking	TA Name	Office hours	Email	Office hour location
402	Thurs	3:30 - 4:29p	GLAB 102	Optional	Talia Boyajian	Monday 9-10 pm	talboyaj@sas.upenn.edu	Zoom link
Links to an external site.								
403	Thurs	3:30 - 4:29p	GLAB 525	Optional	Talia Schor	Monday 2:15pm-3:15pm	tschor12@sas.upenn.edu	Williams Cafe Lobby (but if needs to be Zoom: link)
Links to an external site.								
404	Thurs	3:30 - 4:29p	MEYH B5	Optional	Julie Elfishawy	Tuesday 10am - 11am	jelfisha@sas.upenn.edu	Zoom link
Links to an external site.								

405	Thurs	3:30 - 4:29p	TOWN 315	Required	Caroline Beech	Monday 9:30am-10:30am	cbeech@sas.upenn.edu	Zoom link
-----	-------	--------------	----------	----------	----------------	-----------------------	----------------------	---------------------------

[Links to an external site.](#)

406	Thurs	5:15 - 6:14p	PSYL C41	Required	Sylvia Zhao	Tuesday 4 PM - 5 PM	syzhao@sas.upenn.edu	Zoom link
-----	-------	--------------	----------	----------	-------------	---------------------	----------------------	---------------------------

[Links to an external site.](#)

407	Thurs	5:15 - 6:14p	PSYL A30	Required	Caitlyn Kim	Monday 12pm - 1pm	kcaitlyn@sas.upenn.edu	Zoom ID 549 453 8290
408	Fri	10:15 - 11:14a	DRLB 4E9	Optional	Stephanie Shen	Tuesday 9am-10am	stephshn@sas.upenn.edu	Zoom Link

[Links to an external site.](#)

Password: WJzhB4

409	Fri	10:15 - 11:14a	JAF F 104	Optional	Amy Fang	Thursday 11am - 12pm	amyfang@sas.upenn.edu	https://upenn.zoom.us/j/7580847611
410	Fri	12 - 12:59p	PSYL C41	Optional	Julia Ongchooco	Friday 11-12pm	juliaong@sas.upenn.edu	Zoom link

[Links to an external site.](#)

411	Fri	12 - 12:59p	BENN 224	Required	Vinh Hau	Wednesday 2:30 pm - 3:30 pm	vhau@wharton.upenn.edu	Zoom ID 374 577 5583
-----	-----	-------------	----------	----------	----------	-----------------------------	------------------------	----------------------

412	Fri	1:45 - 2:44p	PSYL C41	Required	Minfei Shen	Wednesday 5:30 pm to 6:30 pm	minfei@sas.UPenn.edu	Zoom ID 3298517872
-----	-----	--------------	----------	----------	-------------	------------------------------	----------------------	--------------------

1.3 Covid-19

Although the worst of the pandemic may be behind us, COVID-19 continues to infect, harm, disable, or even take lives. Moreover, we are all dealing with the fallout and trauma of multiple years of isolation, illness, and death. You most likely know people who have lost their jobs, have tested positive for COVID-19, have been hospitalized, or perhaps have even died. You may have tested positive for COVID yourself, and are dealing with long covid symptoms or other issues. You might have increased (or possibly decreased) work responsibilities and increased family care responsibilities—you might be caring for extra people (young and/or old!) right now, and you might be facing uncertain job prospects (or have been laid off!).

All of this is to say life has been disrupted, and may continue to be, to a greater or lesser extent, for some time. **We, the teaching team, are sympathetic to any Covid fallout you have had to deal with or continue to deal with. If such things – or any life challenge! – are making it hard for you to participate fully in this class, let us know! We will do our best to accommodate you. We hope you will extend us a similar grace.**

2 Requirements and Expectations

2.1 Readings

All texts will be made available on the course Canvas site. *There are no required books for the course.* We will post required and supplemental readings. Required readings are required, and are fair game for homework and exam questions. We recommend you complete the reading assigned for a class before, rather than after, the synchronous class session, so that you can ask questions about the reading in class.

2.2 Lecture Slides and Lecture Recording

Lecture slides will be posted on Canvas just prior to lecture time. All lectures will be recorded and made available on Canvas, usually within 24 hours. We encourage attending the lectures in person so that you can ask questions and interact with the instructors.

2.3 Recitations

Every student in the course is enrolled in a recitation. You should attend the recitation in which you are enrolled. Recitations are intended to reinforce material covered in lecture and will also introduce new material from time to time. You are responsible for material covered in recitations (that is, it will be covered on the homeworks and/or the exams). Recitations may be recorded, but the value will be in actively participating in them. Recitations are held on Thursdays and Fridays and will begin the week of September 5 (so the first recitation is on September 8).

2.4 Policy on Working Together and Plagiarism

We encourage students to discuss ideas from the course and to study together for exams. (See the section on Ed Discussion and “Search for teammates”.)

Homework assignments, however, must be done individually or in pairs. Although you may talk with your classmates about concepts related to the homework, you must do the homework yourself or with at most one classmate. If you work on the homework with a partner, you should each write the PennID of your partner on your submitted homework. Except for a specified partner, you should not discuss specific problems, share details of how you solved a homework problem, let another student look at your homework, etc. (You can review your graded homework after it is returned, and the supplied solutions, with classmates.) Working with more than one partner or failing to state the name of a partner you worked with are violations of academic integrity.

If you collaborate with a partner, for questions that ask for a few sentences or a paragraph as a response, you should not provide the exact same response. You can agree on a general 'gist' of a response, but we want you to provide your answer *in your own words*.

Also note that when taking phrases or facts from any source (books, articles, or the web), be sure to acknowledge where the information was taken from. This is true even if you paraphrase the information. And, any text quoted directly must be enclosed in quotation marks, again with the source noted. The format of the citation does not matter, as long as it is sufficiently detailed for us to find the original source.

If you respond to a homework question with a direct quote from a source you should also expand on, explain, and interpret that quote in your own words. This is separate from the need to put the quote in quotation marks and cite the source. Although it is fine for you to research homework questions and use what you found, we do want to make sure you can explain it yourself.

We reserve the right to run homework through plagiarism detection software, and the graders will also be on alert for cases where highly similar answers are provided by more than one student. Cases of suspected collaboration/sharing of homework with more than one partner, plagiarism, and cheating on exams will be referred directly to the Office of Student Conduct (<http://www.upenn.edu/osc/>). We will not contact you before reporting such cases; you will just hear directly from the OSC.

Additional information about academic integrity may be found at <http://www.upenn.edu/academicintegrity/>. We recommend that you read the material at that site.

2.5 Accessibility Policy

We welcome all Penn students, and are happy to do what we can to make your learning experience comfortable and effective. If you have a disability or needs you think we should know about, please do not hesitate to let us know. We will keep all information strictly

confidential. Please also contact the Weingarten Center if you have a disability and want to learn more about accommodations:

Student Disabilities Services

Weingarten Learning Resources Center

Stouffer Commons 3702 Spruce Street, Suite 300

215.573.9235

<http://www.vpul.upenn.edu/lrc/sds/>

2.6 Religious Observances

We are happy to accommodate your needs in observing religious holidays. *Please contact us within the first two weeks of class if you are going to need religious accommodation.*

In accordance with university policy, no major assignments will be due on Christmas, Rosh Hashanah, Yom Kippur, the first two days of Passover, and Good Friday.

If you observe another holiday and would like similar accommodations, please contact us. We will be happy to make suitable arrangements with you.

For more information about university policies about religious observances, see:

<http://provost.upenn.edu/policies/faculty-handbook/students/iv-h>[Links to an external site.](#)

2.7 Attendance

Lectures. Attendance at lectures is encouraged but not required. You do not need to notify a TA or the professors of your absence from a lecture. Lectures will be recorded and recordings will be posted on canvas. The advantage of coming to lecture is that you will be able to ask questions directly of the professor during the lecture. Please note that recordings of lectures may be of poor quality, and there always is a chance that a recording will fail entirely. If a recording does not occur, and you did not attend that lecture, we recommend that you get notes from someone who attended the lecture and come to the office hours of the TAs and/or Professors, to ask questions about the lecture.

Recitations. Attendance at recitations is strongly encouraged, especially as they typically are not recorded. The expectation is that you will attend the recitation that you registered for, but you can also attend a different recitation if you miss one. Please respect the masking policies of each recitation section.

2.8 Online Platforms

Our Canvas site is: <https://canvas.upenn.edu/courses/1674211>

Ed Discussion – see link on left Canvas menu for the course.

Gradescope – see link on left Canvas menu for the course.

2.9 Assessments

There are three exams and 5 homework assignments:

- Participation: 10%
- Exam 1: 20%
- Exam 2: 20%
- Exam 3: 20%
- Homework: 7.5% each * 4 = 30% (we drop your lowest HW grade, see below)

Participation: We are requiring students to post at least three times on the Ed Discussion board (which you can find in Canvas), and to respond to at least seven other students' posts, throughout the semester. Your posts should use the category 'Free Discussion'. Posts should go beyond clarification of class content (e.g., asking what a dendrite is), and instead raise issues substantive enough for further discussion. For example, you might comment on how something we covered connects in an interesting way to another class or to something in everyday life, pose research questions or theories inspired by class content, or suggest additional experiments to test ideas discussed in class. This component counts for 10% of your grade (1 percentage point for each post or response).

If you do have clarification questions or administrative questions about the class, we also recommend that you post these questions to Ed Discussion, under the appropriate category (*not* Free Discussion). If you have a question about something, chances are another student does as well, and they can benefit from our response to your question.

Please note that Ed Discussion allows you to post anonymously such that other students will not see your name (instructors and TA's will still see your name, for grading purposes). You can use this option if you are uncomfortable with others seeing what you write.

We've also created a 'Social' section on Ed Discussion. Feel free to use section to introduce yourself and make it known that you are looking to connect with fellow classmates. You might consider using this tool to find a study partner, or even just someone to shoot the breeze with.

Homework policy: There will be five homework assignments during the semester, but you can drop your lowest score, so only four homework assignments will count for your final grade (7.5% each). The drop policy is in place to help you, in case unforeseen circumstances prevent you from submitting a homework, or if a particular homework assignment is just very challenging. Please do your best to submit homework and exams on time. In light of covid19 difficulties, we will consider late submissions on a case-by-case basis.

Homework content is still being developed, but you can expect to be asked about material covered in lectures, readings, recitation, and homeworks. Questions could be anything from short

essays, to multiple choice, and could ask you to solve some technical problem, interpret data, or explain a theory.

Homework will be submitted on Gradescope.

Exam information: Exams will administered online, through Gradescope. Exams will be made available at the beginning of class time (1:45 PM) on the day of the exam, and will be available for 24 hours. **You will have 1.5 hours to take the exam in one sitting** (or extra time for those registered for accommodation through Weingarten Student Services.) The exams will be open book.

Each exam will focus on the material presented in the preceding portion of the course, but since some key concepts come up multiple times as the course moves forward, these will in effect be assessed on more than one exam. There will be no final exam during the final exam period, although there will be a 'midterm' on the last day of class.

Exams will include material covered in lectures, readings, recitation, and homeworks. Questions could be anything from short essays, to multiple choice, and could ask you to solve some technical problem, interpret data, or explain a theory.

In contrast to homeworks, you must work on the exam by yourself.

Regrade Policy: If you feel that you did not receive an appropriate number of points on a homework question, or that the answer you chose for an exam item is correct even though we marked it as incorrect, you may request a regrade. To request a regrade, please send your request through Gradescope. These regrade requests must be submitted within 48 hours of when the graded homework/exam was returned.

We will consider and respond to regrade requests after the window for submitting them has closed. This allows us to consider all such requests for a particular assignment together and helps us respond to them in a consistent manner. Our response will depend both on the substance of the request and the quality of your written reasoning about why you think you deserve more points.

Regrade requests are the only mechanism by which your grade on an assignment or exam will be changed -- if your answer was right but you didn't file a regrade request we will not give you more points. Again, this policy is designed to encourage you to review returned assignments and learn from the posted solutions as much as it is to give you more credit. Decisions on regrade requests are final -- there are no "regrade request regrade requests."

Extra credit policy: At the moment, we are not planning any extra credit opportunities. We kindly ask that you refrain from asking us about extra credit opportunities during the semester. Late in the semester, we will evaluate the class grade distribution and assess whether extra credit opportunities seem warranted. Please do not act under the expectation of extra credit.

Extensions: Things come up in life that prevent us from meeting deadlines. It happens. We will generally be pretty generous with giving extensions, and as long as you provide some kind of

explanation, even if that explanation is "I am having a difficult time mentally this week". We are also more likely to give an extension if you ask well in advance, and not the minute before an assignment is due. All that said, it will generally be in your own interest to complete assignments on time, so that you do not fall behind with class material, or other assignments.

2.10 Final grades

Final grades will be given according to this scale:

Grade	Letter Grade	GPA
97-100	A+	4
93-96	A	4
90-92	A-	3.7
87-89	B+	3.3
83-86	B	3
80-82	B-	2.7
77-79	C+	2.3
73-76	C	2
70-72	C-	1.7
67-69	D+	1.3
60-66	D	1
<60	F	0