



Cognition: Methods and Models

PSYC 2040

L0: Getting Started



welcome!

- your **instructor**: Abhilasha Kumar
 - pronunciation: uh-bHi-laa-shaa kumaar
 - pronouns: she/her/hers
- preferred way to address me in person or via email:
 - Professor
 - Professor Kumar
 - Prof. Kumar
- office: Kanbar 217

agenda for today



- meet & greet
- course & canvas walkthrough
- effective study strategies

your learning assistant

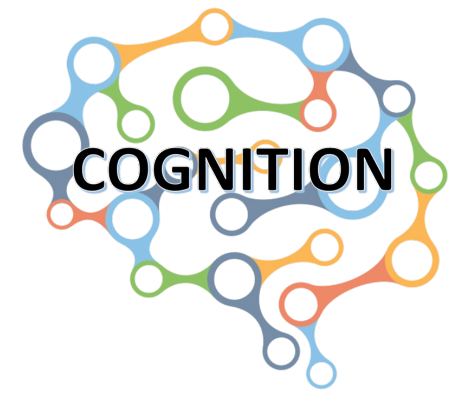
- Matthew Perez
- responsibilities
 - attendance
 - office hours
 - review sessions
 - meme expert
 - question/discussion moderation
- office:



ice-breaker

- pair up with someone you don't know and tell them:
 - your name and pronouns
 - your year & major
 - where home is
 - your favorite food
- then, we will go around and share:
 - what we learned about a peer

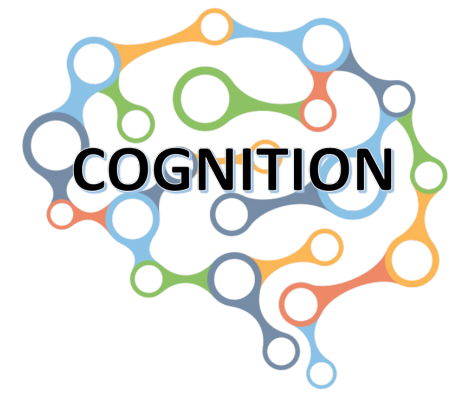




where does the course live?

- course website:
 - <https://teaching-cognition.github.io/cognition/>
 - syllabus, (most) readings, course schedule, and assignment details
 - will be updated regularly
- canvas
 - announcements
 - quizzes + assignment submission
 - grades
 - discussions

what is this course about?



- introducing you to the **scientific study of human cognition**
 - how people acquire, represent, and use knowledge to guide their everyday functioning
- **learning goals**
 - **understand** the fundamental questions & prominent methodologies in the study of cognition
 - **connect** theoretical ideas about cognition to real-world applications and their implications
 - **reflect** on the sociocultural issues surrounding the study of cognition

textbook

- free and open-source textbook written by Dr. Matthew Crump, Assistant Professor at Brooklyn College, NY
 - Matthew J. C. Crump. (2021). *Instances of Cognition: Questions, Methods, Findings, Explanations, Applications, and Implications*. <https://crumplab.com/cognition/textbook>
- no need to purchase/download, all material is available on our website



course syllabus walkthrough

- pair/triple up based on the number you picked out
- discuss and decide who will explain what (5 minutes):
 - group 1: up to course schedule
 - group 2: grading (up to assessments)
 - group 3 (3 students): final project (go to the separate page)
 - group 4 (3 students): extra credit + course policies (up to how many classes can you miss)
 - group 5: course policies (late work onwards)
- share with the class!
 - 2 big takeaways (per student) + any questions

general class format

- you are expected to do the **readings before class**
- **slides** will be uploaded before class
 - minimize looking over in advance so you can be present!
- **class time** will be devoted to
 - lectures + interspersed activities
 - discussions + question time
- **each week**, these things are due
 - conceptual question (due Thursday morning)
 - quiz and/or writing assignment (due Sunday midnight)
 - meme submission (due Sunday midnight)
- some **specific weeks, project milestones** are due
 - always Sunday midnight



to quiz or to write?



- key things to remember:
 - both are worth 5 points
 - each quiz has 10 questions (4 easy, 3 medium, 3 hard)
 - most writing assignments have two options
 - the highest score counts, i.e., you can earn a maximum of 5 points per week
- how to choose:
 - if you feel very good about most concepts a week, try the quiz
 - if a particular writing assignment really speaks to you, do it!
 - I do NOT expect everyone to do BOTH every week

why a final project and not an exam?

- analysis of many years of research shows that **project-based learning** is **beneficial** to student outcomes and achievement
- I want to see your **creativity** and I want you to **enjoy** this class!

Revisiting the effects of project-based learning on students' academic achievement: A meta-analysis investigating moderators

Cheng-Huan Chen ^a ✉, Yong-Cih Yang ^b ✉

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<https://doi.org/10.1016/j.edurev.2018.11.001>

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Highlights

- A 20-year meta-analysis of journal articles on project-based learning is presented.
- Results showed a medium-to-large mean effect size (0.71) for student achievement.
- Effects were stronger for social science subjects than for science subjects.
- Effects were larger in studies involving Western students than East Asian ones.
- Educational stage and group size were not identified as significant moderators.

how to get the most out of a group project

- reflect on your own strengths and weaknesses
- work on an accountability contract
- meet in person whenever possible (30 minutes - 1 hour)
 - have a shared google doc for meeting notes
 - have a meeting agenda and pre-assigned tasks
 - meet 1-2 weeks before milestone deadlines to assign tasks/roles
 - meet on the day of submission for final touches
 - collaborate & engage; don't divide and conquer!
- be honest in your self and peer assessments
- communicate effectively and often, especially when things are not going well or you are struggling





canvas walkthrough (Matt)

exercise: **how** do you study?

- let's take 2 minutes to note:
- what **study methods** do you typically use when you are preparing for an exam?
- think of **as many strategies** as you use
- try to identify the ones you use **more frequently** and the ones you use **less frequently**.



study strategies and their frequency

<i>Strategy</i>	<i>Percent who list strategy</i>		<i>Percent who rank as #1 strategy</i>		<i>Mean rank</i>
1. Rereading notes or textbook	83.6	(148)	54.8	(97)	1.5
2. Do practice problems	42.9	(76)	12.4	(22)	2.1
3. Flashcards	40.1	(71)	6.2	(11)	2.6
4. Rewrite notes	29.9	(53)	12.4	(22)	1.8
5. Study with a group of students	26.5	(47)	0.5	(1)	2.9
6. “Memorise”	18.6	(33)	5.6	(10)	2.0
7. Mnemonics (acronyms, rhymes, etc)	13.5	(24)	2.8	(5)	2.4
8. Make outlines or review sheets	12.9	(23)	3.9	(7)	2.1
9. Practise recall (self-testing)	10.7	(19)	1.1	(2)	2.5
10. Highlight (in notes or book)	6.2	(11)	1.6	(3)	2.3
11. Think of real life examples	4.5	(8)	0.5	(1)	2.8

three effective study strategies

- retrieval practice
- elaborative encoding
- spaced practice



retrieval practice

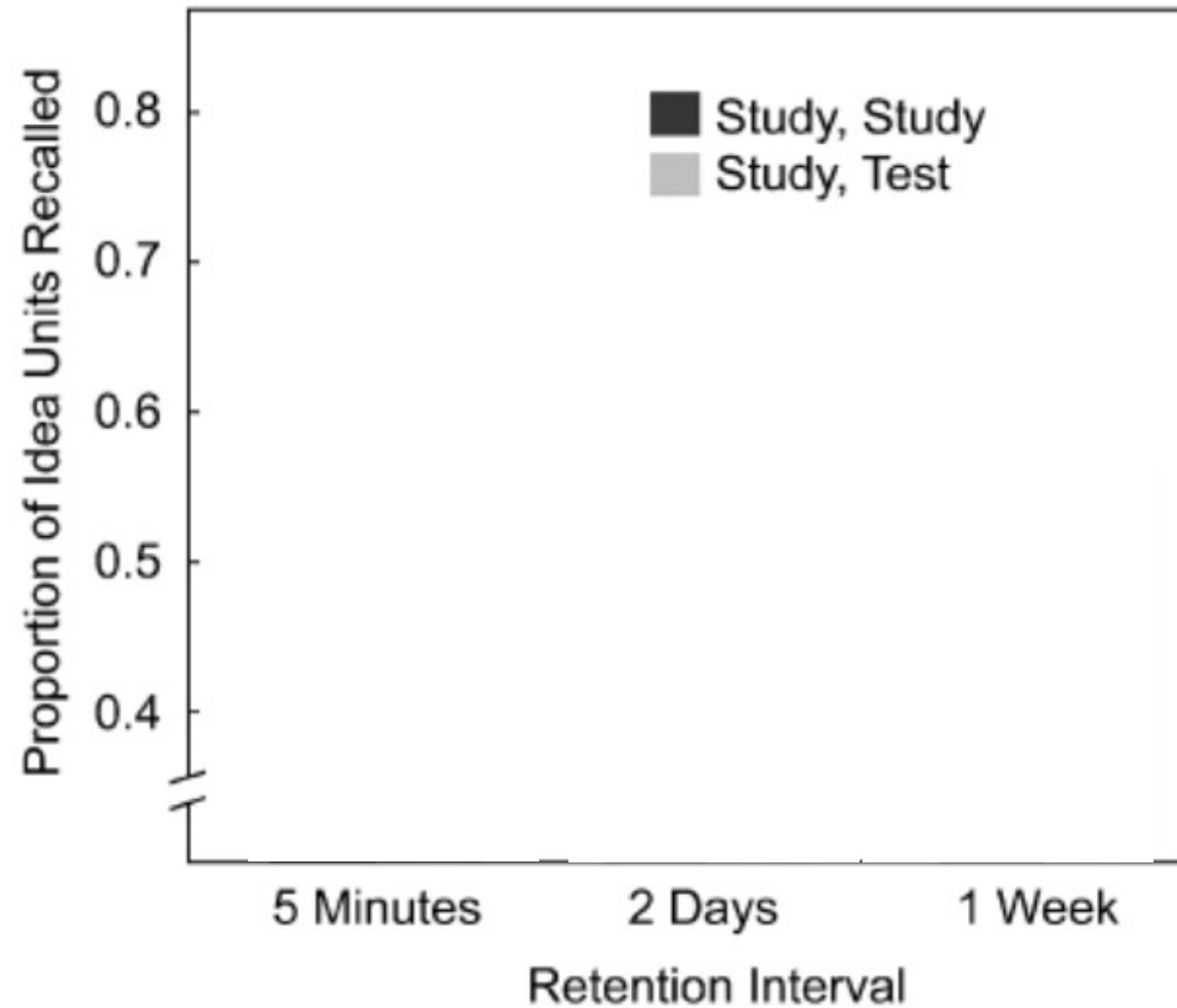
Research Article

Test-Enhanced Learning

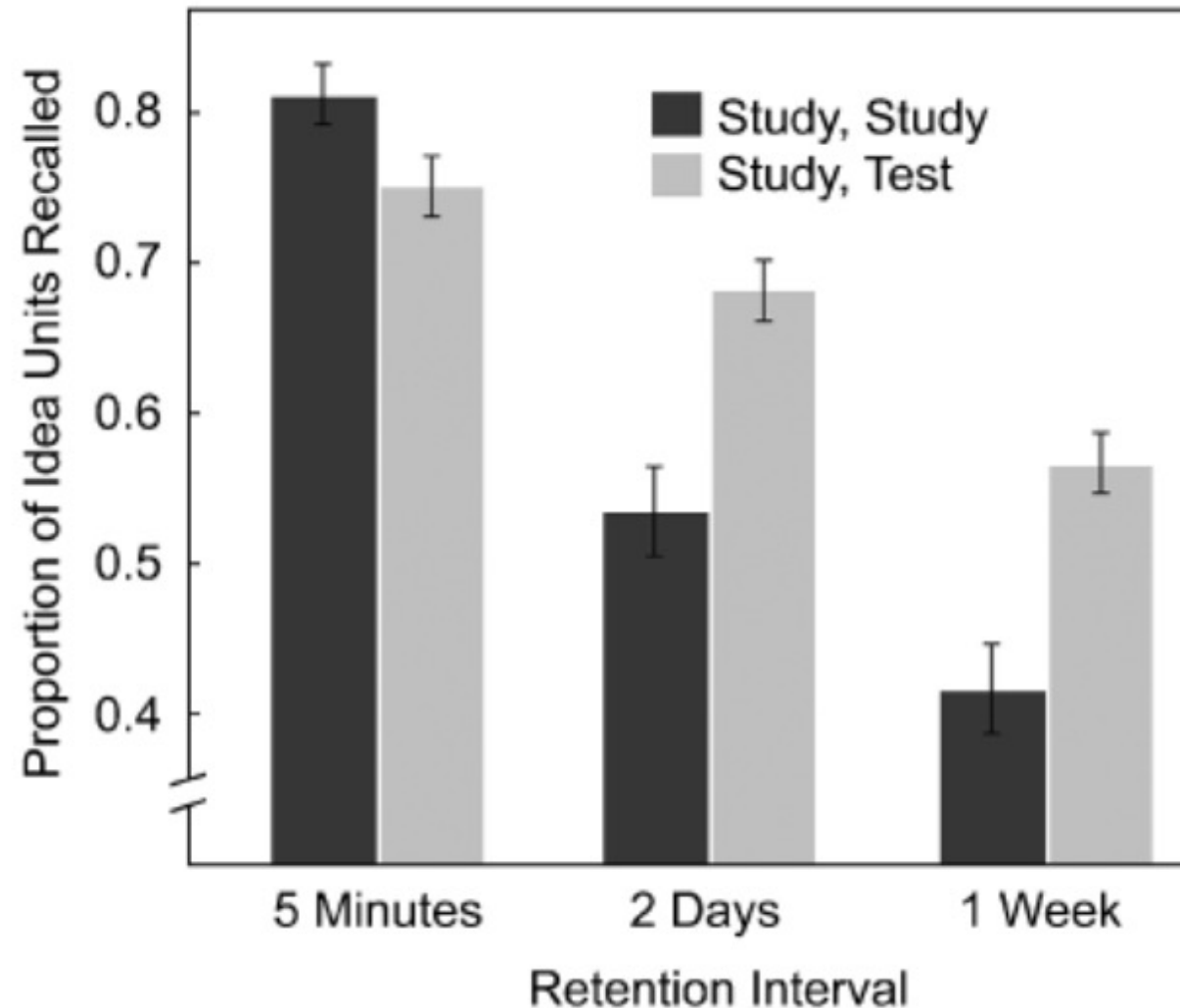
Taking Memory Tests Improves Long-Term Retention

Henry L. Roediger, III, and Jeffrey D. Karpicke

Washington University in St. Louis



retrieval practice



Research Article

Test-Enhanced Learning

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a test can take many different forms
for example:

- weekly quizzes
- writing what you remember from a lecture/reading
- teaching a friend or family member
- flashcards

retrieval practice in a college classroom

- undergraduate statistics for psychology at the University of Louisville
 - section 1: students answered ~4 questions during the last 5-10 minutes of class without looking at their notes
 - section 2: business as usual, nothing special at the end of class
- both sections took the same 4 exams throughout the semester
- on average, students in section 1 (86%) did better on exams than students in section 2 (78%)
- bottom line: spending 5-10 minutes after each class meeting to review that day's lecture from memory can boost exam performance

class exercise!

sentences about different men will be presented on the screen one at a time

please **read and try to remember** each of the sentences on your own

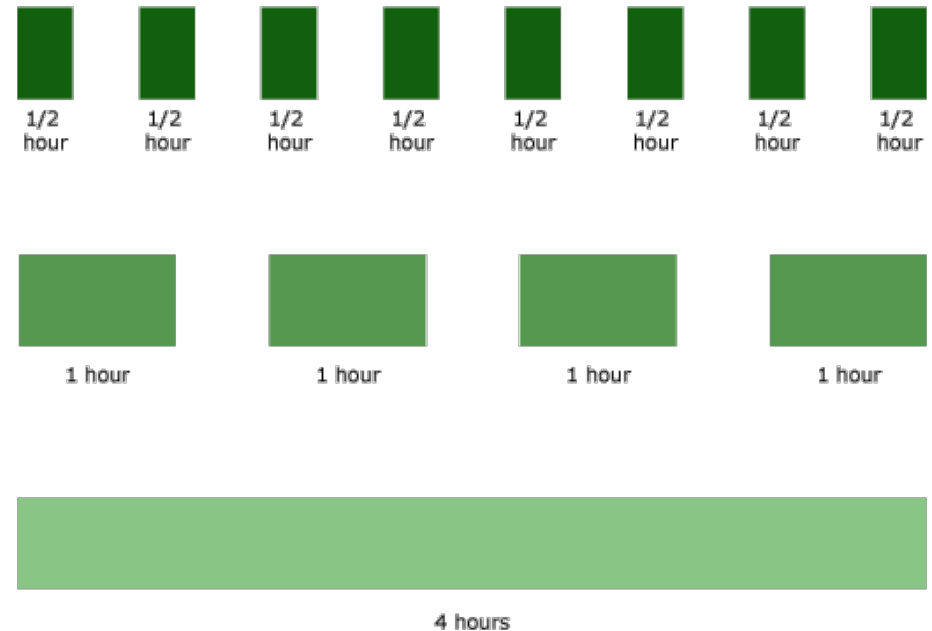
do not write anything down!

elaborative encoding in a college classroom

- undergraduate biology students at Salisbury University
 - group 1: answered simple “why” questions embedded in textbook sections
 - group 2: read the same textbook sections twice
- all students took the same 105-question test
- on average, students in group 1 (76%) did better than students in group 2 (69%)
- bottom line: asking yourself “why” questions as you read a textbook (or other course material) can improve your memory for what you are reading.

spaced practice

- distributing study sessions **over time (spacing)** instead of cramming them into one long study session (massing)



spaced practice in medical school

- surgical residents in a Chicago medical school were trained in microsurgery (videos and practice on a synthetic artery model)
 - group 1 (massed): 4 training sessions all in one day
 - group 2 (spaced): 4 training sessions over one month
- a month after the last training, all residents took the same test, where they were asked to repair the damaged aorta of an anesthetized rat
- ~15% of the residents in the massed group failed the task, whereas all the residents in the spaced group succeeded (no one failed)

spaced practice in a college classroom

- undergraduate precalculus course for engineering students
 - **condition 1**: multiple questions on a topic appeared all on one quiz (**massed**)
 - **condition 2**: multiple questions about a topic were **distributed across 3 quizzes** administered over multiple weeks
- all students took the same precalculus final exam and the same readiness exam for calculus at the start of the following semester
- on average, students who took the **spaced quizzes did better** than the students who took **massed** quizzes on both exams
- bottom line: **spacing out your studying** over time can boost long-term retention of course material

bottom line: study actively, not passively

- utilize **evidence-based effective** study strategies:
 - **retrieval practice**: quiz yourself, ask-a-friend, flash cards
 - **elaborative encoding**: ask “why” questions, use mental maps, paraphrase
 - **spaced practice**: space out your studying, do not cram!
- but...your **attitudes** toward effort also matter
 - a “growth mindset”
 - read the assigned chapters/readings **before** class
 - come prepared to class for engagement
 - minimize distractions (more next time on this!)
 - plan early for assignments, assessments, and projects

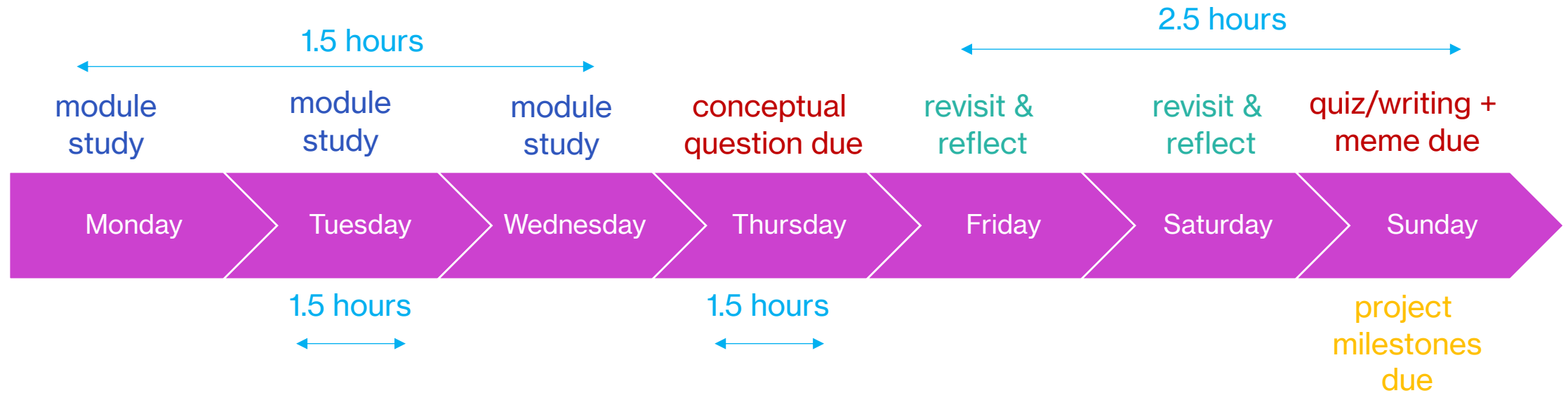


the course is designed to support you

- retrieval practice
 - class participation via activities/reflections
 - weekly quizzes on each learning module
 - mid-semester assessments
- elaborative encoding
 - writing assignments that push you to think more deeply about the content
 - conceptual discussion questions
 - final projects that help you connect concepts learned in class via newer formats
- spaced practice
 - mid-semester assessments that cover broader content

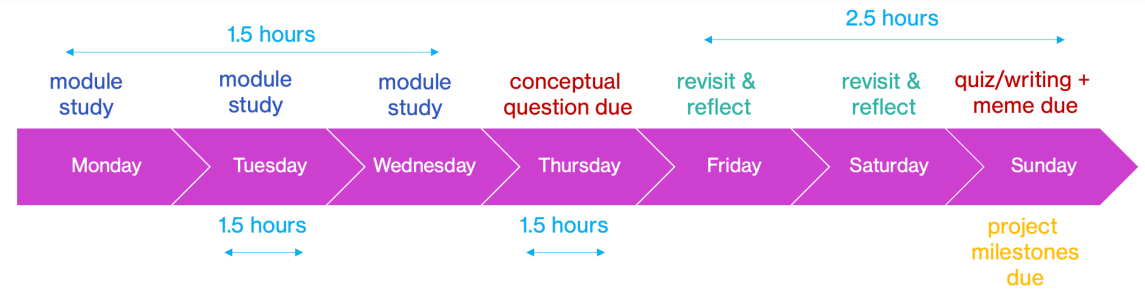


a weekly breakdown



* project milestones will be due on Sunday during some weeks, so, this structure might need to change for those weeks

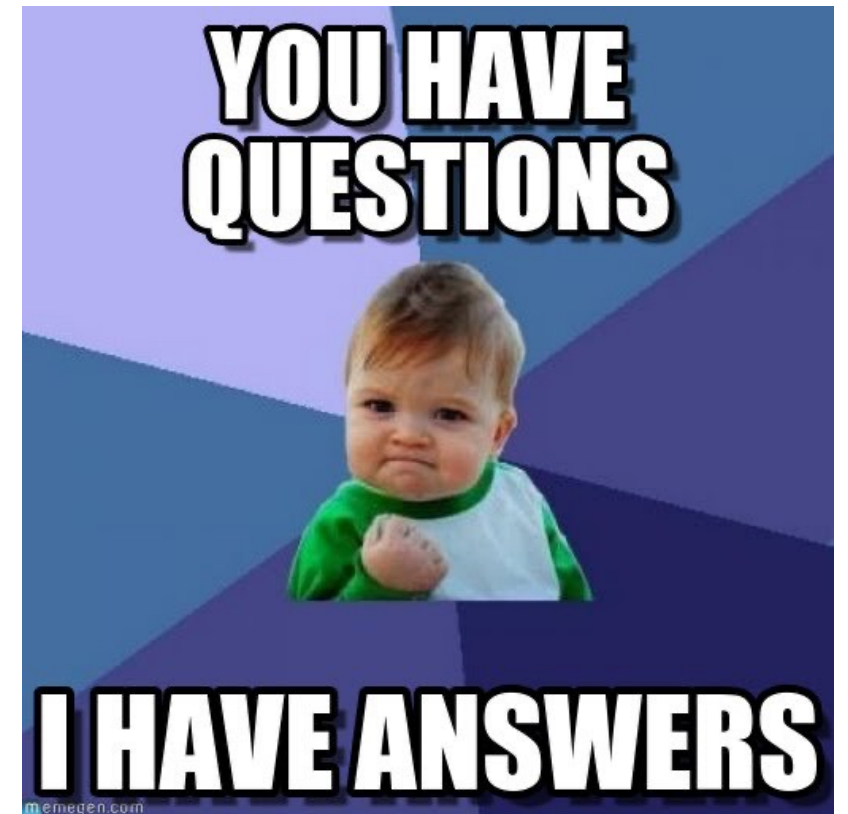
if I was a student...



- I would
 - USE A CALENDAR!!
 - keep track of project milestones a week ahead of time
 - schedule in-person/zoom time with group partner(s) to work on milestones
 - actively study module material before Tuesday
 - use retrieval practice / elaborative encoding strategies
 - make high-quality notes in class
 - post my conceptual question by Wednesday night
 - revisit my notes and do some retrieval practice / reflection on Thursday/Friday
 - select and complete the more enjoyable/doable quiz/writing assignment on Friday/Saturday
 - think about a possible meme on Saturday/Sunday
 - evaluate whether I need to do another assignment on Saturday/Sunday

when you have thoughts and questions

- office hours: these are YOUR hours!
 - will be finalized by Thursday
- meetings by appointment
- anonymous feedback
 - end of February, March, and April



reasons to come to office hours (and whose)

- Prof. Kumar
 - Qs about material
 - Qs about course policies/assessments/grades
 - reflections on the classroom experience
 - discussions about final project
- Matt
 - informal feedback about course pace
 - Qs about Canvas deadlines/due dates
 - review sessions before assessments



valuing our voices



- I will try my very best to create an **inclusive environment** for all of you
 - we are all **different** and that is a **strength**
 - we also exist **beyond the classroom!**
- but...pobody's nerfect!
 - my style may not match your style
 - I am always listening and learning so PLEASE reach out!

next class



- **before class:**
 - *fill out*: pre-class survey (link in Canvas announcements)
 - *finish*: L0 quiz + writing assignment (**required, due Thursday morning**)
 - *read*: L1: What is Cognition?
 - definitely up to 1.8 (implications)
 - if you have more time, then up to 1.11
- **during class:**
 - what is cognition?
 - how do we study the mind?
 - what does cognitive research look like?