

Psych 125

UCB PSYCHOLOGY 125: *The Developing Brain*

Lectures: TBD

Instructor: TBD

Overview: What are the changes in brain structure and brain function that underlie improvements in cognitive abilities over childhood and adolescence? What insights can we gain regarding the neural basis of cognition by examining how brain function and performance change with age? And how are such findings relevant for medicine, education, and the law? The cutting-edge field of developmental cognitive neuroscience is beginning to address these questions. This course will constitute an overview of current research and methods in this field. We will discuss both typically and atypically developing populations.

Learning Objectives: Being able to present a cogent, well-informed response (or opinion) for each of the questions outlined in the course schedule.

Course requirements: Although there are no specific prerequisites, prior coursework in neuroscience (e.g., MCB C61, C64, Psych 110, 117, C127, CogSci C127) is highly recommended.

Sections: TBD

Graduate Student Instructors:

- TBD

Office hours:

- TBD

Lecture materials and class attendance: Webcasts and slides will be made available shortly after each lecture on the bCourses site. If you come to class, be prepared to listen, take notes by hand, and participate. Use of electronics (laptops, tablets, cell phones) in class is strongly discouraged unless you need accommodations, since studies show that it can distract other students.

Readings: *There exists no undergraduate-level textbook on this topic.* You will be assigned journal articles, including both reviews and empirical papers, as well as a few book chapters. Scientific articles assigned for discussion in section will be posted on the course website at least two weeks in advance of the meeting date.

Grading:

- Four exams, including the final: 50% of course grade
 - Each exam covers the content of 5 lectures and discussion sections.
 - *The lowest of the 4 exam scores will be dropped from the final exam grade calculation. There are no makeup exams; if you have to miss an exam for whatever reason, your grade will simply be calculated based on the average of the other 3 exams. Take note of the exam dates before signing up for the course.*
- Presentation: 15% of course grade
- Paper: 25% of course grade
- Participation: 10% of course grade, based on regular attendance and participation in Section
- Research Participation bonus credits: additional 1% added to grade per RPP credit (up to 3). Provide the researchers with plenty of advance notice if you need to cancel or postpone your appointment so that they can schedule someone else. Canceling at the last minute inconveniences the researchers, slows down the study, and deprives your peers from an opportunity to sign up for

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the slot. You may elect to write a short essay in lieu of participating in experiments; if so, please check with your GSI for more information.

Exams: You will be tested on content presented in lectures and discussion sections, including assigned readings (key readings assigned for section). Questions will be designed to probe understanding of ways in which the research has been, and/or could be, leveraged to address key questions outlined in the course schedule. The format for the first three exams will be primarily short-answer; students may also be asked to draw graphs, label figures, and answer multiple choice questions. The final exam will consist of longer essays answering questions posed in the lecture titles for the final section. Study guides will be provided in advance of all exams.

Presentation: You will be asked to give a 10-minute Powerpoint presentation in Section, providing an overview of 1) part of the assigned reading for the day (a review paper or chapter posted on bCourses), as well as 2) a deeper dive into a relevant study – typically, one of the references cited in the assigned reading. You will need to coordinate with the other students presenting on the same day as you to make sure that your presentations complement one another.

Your presentation should provide:

- a) Sufficient background information to understand the motivation for the study
- b) A clear explanation of the question(s) being addressed
- c) A concise summary of the methods. No nitty-gritty details; provide only what info is needed to understand and critique the results
- d) The take-home message for key figures and tables, summary for additional results of importance
- e) Additional questions that remain unanswered; further studies that could shed light on these results
- f) Efforts to engage peers in discussion by asking them questions

This presentation can serve as a foundation for your paper assignment if you like, although you may prefer to pick a different topic for the paper, in consultation with your GSI. Your GSI will provide more information about this.

Paper: You will be asked to submit, by the beginning of R&R week (April 30th at 11:59pm), a 5-page single-spaced essay about a topic related to one of the lectures. Your essay should provide an overview of the topic, drawing on one or more chapters/review papers as well as a summary of two or more empirical papers. You may not select a topic that you have covered in depth and/or selected for a project in another course. It is expected that you will read in detail and cite *at least* 5 papers for this project. Requirements for the paper are as specified above for the presentation (although the scope of the project is larger).

Late submissions: 5% of the paper grade will be deducted each day past April 30th. Papers will not be accepted after May 7th. It is recommended that you work on this assignment throughout the semester in case of unforeseen events or excessive workload towards the end of the semester, as there will be no exceptions to this policy.

Grading policy:

I believe that my grading policy is clear and fair. You are not graded on a 'curve': I will give an A to all students who work hard & perform well, regardless of how many other students also do well.

Out of respect for your instructors, your peers, and yourself, please refrain from trying to negotiate better grades for yourself. Requests for extensions or for more lenient grading will be declined.

Research Participation Program: For participation in studies through the Research Participation Program (RPP), please read completely the document on bCourses named "RPP Information for students", which has been updated with new information for Spring 2018. Then, set up a Sona account as instructed. We recommend doing this as soon as possible. If you have any questions, you can

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contact RPP at rpp@berkeley.edu. Please also see the deadlines listed on the RPP webpage: <http://psychology.berkeley.edu/students/undergraduate-program/research-participation-program>

Statement on Academic Integrity: Any report submitted by you and that bears your name is presumed to be your own original work that has not previously been submitted for credit in another course. In all of your assignments, you may use words or ideas written by other individuals in publications, web sites, or other sources, but only with proper attribution. "Proper attribution" means that you have fully identified the original source and extent of your use of the words or ideas of others that you reproduce in your work for this course, usually in the form of a footnote or parenthesis. If you are not clear about the expectations for completing an assignment, be sure to ask.

Accommodations: Please let your GSI know if you need accommodations for any physical, psychological, or learning disability, or if you'd like to provide emergency medical information.

Absences: It is your responsibility to inform yourself about material missed because of an absence, and to make up for any missed deadlines.

Conduct: The University of California strives to prevent and respond to harassment and discrimination. Engaging in such behavior may result in removal from class or the University. If you are the subject of harassment or discrimination, please contact the Confidential Care Advocate (sa.berkeley.edu/dean/confidential-care-advocate). Survivors of sexual violence may also want to view survivorsupport.berkeley.edu. For more information, please visit ophd.berkeley.edu.

Questions/feedback for your professor?

I hope you find this course interesting and challenging. I genuinely want you to get to the point where you're well-versed enough in current research on the developing brain to hold informed opinions and make informed decisions in your own lives. As such, *please bring me your questions about the material, and general feedback about the class! I also welcome you to talk with me about science, and/or your career goals.*

For those of you interested in gaining research experience, either as volunteers or for course credit: when there are openings in my lab (which is not very often), they are posted through URAP (<http://urap.berkeley.edu/>) or the Student Services Office in Psychology. My grad students and postdocs select their own research assistants.

CLASS SCHEDULE

PART I Foundations

- 1. TBD Introduction
- 2. TBD How do we study the developing brain?
- 3. TBD Prenatal brain development: what's going on in there?
- 4. TBD Which factors influence prenatal brain development?
- 5. TBD How does the brain develop after birth?
- 6. TBD What is experience-dependent brain plasticity?
- 7. TBD What are the effects of early life adversity on the developing brain? (*Loren Hampton*)

Exam #1: TBD

PART II Building blocks of cognition

- 8. TBD How does a baby's brain support perception?
TBD: Administrative holiday
- 9. TBD How early, and how, do we acquire language?
- 10. TBD How much, and how, can a young child remember?
- 11. TBD How do attention and working memory develop?
- 12. TBD Is play necessary for development? (*Katherine Kimura*)

Exam #2: TBD

PART III Higher cognitive functions

- TBD How does memory change in late childhood? (*Wei-Chun Wang, Ph.D.*)
- TBD When and how do children first start to understand numbers? (*Ariel Starr, Ph.D.*)
- TBD How do math skills develop?
- TBD How do reasoning skills develop?

Spring break: TBD

- TBD Why is self-regulation so difficult, and how do we improve at it over development?

Exam #3: TBD

PART IV From science to society

- TBD Why do adolescents take more risks than either children or adults?
- TBD How does physical health affect the developing brain?
- TBD Does/could 'brain training' work for kids? (*Belén Guerra-Carrillo*)
- TBD *No class*
- TBD How is research on brain development relevant for public health?
- TBD How is research on brain development relevant for the law?

Final Paper due TBD

Exam #4: TBD