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 new field of developmental cognitive neuroscience is beginning to address these questions. This course will constitute an overview of current research and methods in the field of developmental cognitive neuroscience. Throughout the course we will discuss both typical and atypically developing populations.

Prerequisites: None, other than a willingness to participate in class & engage in active learning.

Readings: Will be posted on the course website at bspace.berkeley.edu

Grading:
Exam #1: 20%
Exam #2: 20%
10- or 15-minute class presentation: 20%
Wiki project: 20%
Final Exam: 20%

Exams:
Exam format will be primarily short-answer; students may also be asked to draw graphs and provide labels for figures. If one of the 3 exams is missed, the exam grade will be the average of the other two – if and only if the student provides the GSI with adequate documentation for missing the exam.

Class presentation (10-15 minute Powerpoint presentation):
Each student will sign up to present an empirical paper during class, covering the following:
a) sufficient background information to understand the motivation for the experiment
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) what you’ve learned from this paper, additional questions that remain unanswered, and/or further experiments that could shed light on these results
Students may switch the date of a class presentation with a classmate if they arrange this in advance and notify the GSI. Students who do not wish to give a presentation can opt out by submitting two 5-page single-spaced essays for the Wiki project rather than just one.

Wiki Project:
Each student will write a 5-page single-spaced essay & a glossary of key terms for a publicly accessible Wiki on brain development. This essay will in most cases be a companion piece to the student’s presentation (unless the student decides to pick a different topic). The essay should provide an overview of the class topic, drawing on one or more chapters(review papers, as well as a summary of 2-3 empirical papers. Classmates will be asked to review each others’ contributions during section, with
the eventual goal of publishing a series of high-quality essays online.

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.

Students with Disabilities:
Please let Dr. Bunge and/or your GSI know if you need accommodations for any physical, psychological, or learning disability, or if you would like to provide emergency medical information.
Course Schedule

Meeting #1  Studying the developing brain: Why and how
Meeting #2  Early brain development
Meeting #3  Campus holiday
Meeting #4  Sensitive periods and neural plasticity
Meeting #5  Structural brain development & overview of brain anatomy
Meeting #6  Environmental influences on brain development
Meeting #7  Learning, motivation, & play
Meeting #8  Measuring brain function
Meeting #9  Brain networks; the ‘resting’ brain
Meeting #10 Exam #1
Meeting #11 Attention and working memory
Meeting #12 Working memory training; ADHD
Meeting #13 Perceptual expertise: Face recognition; Prosopagnosia
Meeting #14 Social and emotional development; Autism
Meeting #15 Language development; Hearing and deaf children; Effects of SES
Meeting #16 Acquiring knowledge about the world: Semantic memory
Meeting #17 Laying down personal memories: Episodic memory; Amnesia
Meeting #18 Reading; Dyslexia
Meeting #19 Exam #2
Meeting #20 Numeracy & mathematics development; Dyscalculia
Meeting #21 Cognitive control; Frontal lobe injuries
Meeting #22 Reasoning
Meeting #23 Campus holiday
Meeting #24 Cognitive interventions: promise/hype? Educational reform
Meeting #25 Puberty: hormones, neural changes, culture, & peers
Meeting #26 Adolescent decision-making, risk-taking, & emotion regulation
Meeting #27 Psychopathy, frontal damage; Legal implications of research on brain development
Meeting #28 Public policy & education reform
Meeting #29 Reading Week
Final Exams