PSYC 2481

Developmental Cognitive Neuroscience

3 points

Instructor: Prof. Dima Amso, Ph.D.
Class Time: TBA
Class Location: online
Office Hours: Tuesdays 9-10 and 12-1

Course Bulletin Description:
The course will be an introduction to the science of structural and functional brain development beginning in the prenatal period. We will cover major domains in both cognitive and social development. This is a flipped course, where students will watch lectures online (three 55 minute lectures each week) and participate in classroom discussions and exercises (1 hour 50 minutes twice a week) with the Professor and each other when in person.

Prerequisites: PSYC UN1001 The Science of Psychology or an equivalent introductory psychology course.

Contact hours: The class meets 6 hours and 20 min every week. There will be 3 x 55 minute video lectures. We will meet twice per week **on Zoom** for 1 hour and 50 minutes each (TBA) meetings.

Readings: Readings will come from a free collated textbook from the Noba Project chapter collection and will also include empirical and review papers. The book, journal articles, and review chapters will be posted to Courseworks as pdfs.

Dima Amso, Developmental Cognitive Neuroscience, Noba Project Text Book, http://noba.to/xwbp64g7

Course Role in Departmental Curriculum

PSYC UN24xx is a flipped classroom lecture course designed to introduce undergraduate students to the field of developmental cognitive neuroscience. The course is open to both majors and non-majors. It will fulfill the following degree requirements:

1. For psychology majors and psychology post-baccalaureate certificate students, this course counts toward the Group 2 (psychobiology and neuroscience) distribution requirement.
2. For Neuroscience and Behavior majors, this course counts towards the P4 requirement (2000 level psychology course from an approved list).
3. For undergraduate students in CC and GS, this course will count towards fulfillment of the science requirement.

Grading and Evaluation

(1) Class participation (20%). Attendance is mandatory. Participation in discussions is expected of every student.
(2) One short (3-5 page) essay discussion on a topic to be announced in class (30%). DUE JUNE 1.
(3) Two exams (50%).
EXAM 1 -MAY 17
FINAL EXAM – FINAL EXAM PERIOD

Grading: Details regarding expectations and grading will be provided in class.

>=97.5-100: A+	>=87-90: B+	>=77-80: C+	60-70: D
>=94-97.5: A	>=84-87: B	>=74-77: C	<60: F]
>=90-94: A-	>=80-84: B-	>=70-74: C-	

Fostering an Inclusive Classroom: My aim is to foster a learning environment that supports a diversity of perspectives and experiences and honors your identities. Please reach out to me with any concerns or suggestions you may have to better address your learning needs and to improve the effectiveness of this course. I look forward to working together to create a classroom community built on mutual respect and inclusivity.

Students with special needs who may require classroom/test accommodations should make an appointment with me before or during the first week of class. You should also contact the Office of Disability Services (ODS) in Lerner Hall before the start of the course to register for these accommodations. The procedures for registering with ODS can be found at https://health.columbia.edu/content/disability-services or by calling (212) 854-2388.

Promoting Wellness: Many of us have periods in which our mental health and well-being suffer. I urge you to take care of yourselves – and of each other. Please prioritize your mental health and wellbeing and know that there are many resources available to you both within our classroom community and throughout the university:

https://health.columbia.edu/content/counseling-and-psychological-services
http://blogs.cuit.columbia.edu/nightline/
https://universitylife.columbia.edu/student-resources-directory#health

Ensuring Academic Integrity: As members of this academic community, we are responsible for maintaining the highest level of personal and academic integrity, which includes presenting only our own work on assignments and exams. You can find detailed definitions and examples in Columbia University's Guide to Academic Integrity:
(http://www.college.columbia.edu/academics/academicintegrity).

Any questions of academic integrity will be automatically referred to Columbia's office of Student Conduct and Community Standards. The semester progresses very quickly, and there is a lot of material to learn. If you find yourself in a situation – e.g., starting an assignment too late – in which it seems like the best option may be to violate your academic integrity, please see me. Together, we can work out a solution. It is far better to have a few points deducted from an assignment than to compromise your academic integrity and potentially put your academic standing at the

university in jeopardy. Plagiarism—whether intentional or inadvertent—is a serious violation of academic integrity. If you have any questions about what constitutes plagiarism and/or how to properly cite sources, please come to me. I am more than happy to help.

TENTATIVE COURSE SCHEDULE

Week 1
Class 1 Course Introduction: The Nervous System (55 min recorded lecture)
Read: Noba Text Chapter 1 Aneeq Ahmad

Class 2: The Brain (55 min recorded lecture)
Read: Noba Text Chapter 2 Diane Beck & Evelina Tapia

Class 3: Epigenetics in Psychology (55 min recorded lecture)
Read: Noba Text Chapter 3 Ian Weaver

In-person class meetings Date: TBA (1 hour and 50 minutes twice a week)

Week 2: Brain & Cognitive Development I
Class 1: The Nature-Nurture Question I (55 min recorded lecture)
Read: Noba Text Chapter 4 Eric Turkheimer

Class 2: Brain Development (55 min recorded lecture)
Read: Gilmore JH, Knickmeyer RC, Gao W. Imaging structural and functional brain development in early childhood. Nat Rev Neurosci. 2018;19(3):123-137.

Class 3: Infant Brain/Cognitive Development (55 min recorded lecture)
Read: Noba Text Chapter 5 Lorin Lachs

In-person class meetings Date: TBA (1 hour and 50 minutes twice a week)

Week 3: Brain & Cognitive Development II
Class 1: Language Development (55 min recorded lecture)
Read: Noba Text Chapter 6 Yoshihisa Kashima

Class 2: Memory& Forgetting (55 min recorded lecture)
Read: Noba Text Chapter 9 Kathleen B. McDermott & Henry L. Roediger

& 10 Nicole Dudukovic & Brice Kuhl

Read: Faraneh Vargha-Khadem and Francesca Cacucci *(2021)* A brief history of developmental amnesia, *Neuropsychologia, 8.*

Read: Lindsey N. Mooney, Elliott G. Johnson, Janani Prabhakar, Simona Ghetti (2021). Memory-related hippocampal activation during sleep and temporal memory in toddlers, *Dev Cog Neuro.*

Class 3: Attention (55 min recorded lecture)
Read: Noba Text Chapter 11 Frances Friedrich

Read: Amso D, Scerif G. The attentive brain: insights from developmental cognitive neuroscience. Nat Rev Neurosci. 2015;16(10):606-619. doi:10.1038/nrn4025

In-person class meetings Date: TBA (1 hour and 50 minutes twice a week)

<u>Week 4:</u> Brain & Cognitive Development III
Class 1: ADHD & Behavior Disorders (55 min recorded lecture)
Read: Noba Text Chapter 12 Richard Milich & Walter Roberts

Class 2: Executive Functions 1 (55 min recorded lecture)
Diamond A. Executive functions. Annu Rev Psychol. 2013;64:135-168. doi:10.1146/annurev-psych-113011-143750

Class 3: Executive Functions 2 (55 min recorded lecture)
Read: Bunge & Zelazo (2006). A Brain-Based Account of the Development of Rule Use in Childhood. *Current Directions in Psychological Science, 15*(3).118-121.

Read: Cortés Pascual A, Moyano Muñoz N, Quílez Robres A. The Relationship Between Executive Functions and Academic Performance in Primary Education: Review and Meta-Analysis. *Front Psychol*. 2019;10:1582. Published 2019 Jul 11. doi:10.3389/fpsyg.2019.01582

In-person class meetings Date: TBA (1 hour and 50 minutes twice a week)

<u>Week 5:</u> Social Brain Development I
Class 1: Temperament & Attachment (55 min recorded lecture)
Read: Noba Text Chapter 13 R. Chris Fraley

Class 2: Social & Personality Development (55 min recorded lecture)
Read: Noba Text Chapter 15 Ross Thompson

Class 3: Theory of Mind (55 min recorded lecture)
Read: Noba Text Chapter 17 Bertram Malle

In-person class meetings Date: TBA (1 hour and 50 minutes twice a week)

<u>Week 6:</u> Social Brain Development I

Class 1: Culture (55 min recorded lecture)
Read: Noba Text Chapter 14 Robert Biswas-Diener & Neil Thin
Read: Hruschka DJ, Medin DL, Rogoff B, Henrich J. Pressing questions in the study of psychological and behavioral diversity. *Proc Natl Acad Sci U S A*. 2018;115(45):11366-11368. doi:10.1073/pnas.1814733115

Read: Blakemore SJ, Mills KL. Is adolescence a sensitive period for sociocultural processing? Annu Rev Psychol. 2014;65:187-207. doi: 10.1146/annurev-psych-010213-115202. Epub 2013 Sep 6.

Class 2: Stereotype & Prejudice (55 min recorded lecture)
Read: Noba Text Chapter 16 Susan T. Fiske

Read: Rege, M., Hanselman, P., Solli, I. F., Dweck, C. S., Ludvigsen, S., Bettinger, E., . . . Yeager, D. S. (2020). How can we inspire nations of learners? An investigation of growth mindset and challenge-seeking in two countries. *American Psychologist.* Advance online publication. http://dx.doi.org/10.1037/amp0000647

Class 3: Autism (55 min recorded lecture)
Read: Noba Text Chapter 18 Kevin A. Pelphrey

Read: Hazlett, H., Gu, H., Munsell, B. *et al.* Early brain development in infants at high risk for autism spectrum disorder. *Nature* **542,** 348–351 (2017). https://doi.org/10.1038/nature21369

In-person class meetings Date: (1 hour and 50 minutes twice a week)