Columbia University - Fall 2024 Syllabus
PSYC 3495 GENE-ENVIRONMENT INTERACTIONS & EPIGENETICS
Tue-Thurs 1:10-2:25pm at TBA

Instructor: Elif Aysimi Duman, Ph.D. (ead2145@columbia.edu)
Office hour: TBA at 356 Schermerhorn
TA: TBA
Office hour: TBA

Course description and learning objectives: This course is a combination of a lecture and a seminar course, and will therefore include both lectures on the biopsychosocial bases of individual differences in behavior as well as discussion of related research. We will start by examining how individual differences in behavior and health are shaped by gene-environment interactions. We will complement these studies with the endophenotype approach and discuss its role in our contemporary views of complex disorders. We will then introduce behavioral epigenetics studies that are suggested to mediate the effects of gene-environment interactions at different levels of analysis. We will continue by discussing how these topics shape and are shaped by developmental programming. We will end the semester by discussing the major debates around these topics as well as their implications in real life and public policies. By covering these topics, students are expected to gain a better understanding of how our behavior is i) formed and shaped by gene-environment interactions over time, ii) influenced by the underlying physiological and epigenetic mechanisms, and iii) changed by developmental processes. With this information, the students are expected to view individual differences in behavior in a perspective that is highly interdisciplinary and dynamic.

Prerequisites: PSYC 1001 Introduction to Psychology is required. An introductory knowledge in neuropsychology (e.g. Behavioral Neuroscience (PSYC 2450)/Cognitive Neuroscience (PSYC 2430)) and statistics is highly recommended.

Course readings: For every class, we will have readings from books and scientific articles. Articles & book chapters will be posted on Courseworks. A summary of the lecture slides will be posted on Courseworks after class.

Recommended books:

- Kendler, K. S., Jaffee, S. R., & Romer, D. (2011). The dynamic genome and mental health: The role of genes and environments in youth development. New York: Oxford University Press.

- Lamb, M. J., Jablonka, E. (2014). Evolution in Four Dimensions: Genetic, epigenetic, behavioral, and symbolic variation in the history of life. United Kingdom: MIT Press. Available in Science & Engineering Library.

Course format, policies and grading:

The course consists of 5 main topics that will build upon each other. For each topic, we will start with a lecture that covers the background, followed by a discussion of related articles and book chapters. For more focused group work, we will have 4 group discussion days and 2 group presentation days throughout the semester.

During discussion sessions, students will be presented with introductory questions related to the topic and will discuss these questions in groups of 3-4 for the first 30 min of class. The same questions will then be discussed with the whole class for the remainder of class time, together with additional questions from the students. Participation in these discussions together with in-class activities will be worth 25% of your final grade.

Group presentations (15%) will include working in groups of 4-5 to present an empirical research article on the related topic. Each student will contribute to one group presentation and each presentation will last 20 minutes (14-15 min ppt, 4-5 min Q&A). Further details will be posted on Courseworks. Briefly, students are expected to prepare a ~10-slide presentation of the article covering each section (Introduction, Method, Results, Discussion; ~2 slides each) and end with a section (~2 slides) that connects the findings of the article with the lecture content.

In classes with assigned readings, students will submit reading responses as. 2 questions/comments on Courseworks a day before class by 5pm. Examples of these will be provided at the beginning of the semester. You are expected to submit these responses at least 8 times during the semester (out of approx. 15 times) that will be worth 20% of your grade (2.5% each). If you submit more, your top 8 grades will be considered. Late submissions will not be accepted.

As a final assignment, you will write a mini APA-style literature review (4-5 pages excluding references) on a course-related topic (40%). We will talk about your potential topics throughout the semester and discuss your proposals in class to receive feedback from me and your peers.

Participation, in-class activities, discussions	**25%**
Group presentation	**15%**
Reading responses	**20%**
Final mini literature review	**40%**

Attendance, academic integrity and support:

Attendance & participation: Students are expected to attend all classes and participate in discussions. In case you will not be able to attend, you should notify me asap to guide you on how to catch up with the class/assignments missed.

For reading responses, since they are time sensitive and you only need to submit them 8 times during the semester, there will be no late submissions.

For other assignments, if you miss a class/assignment, you should send me and your TA an email detailing the reason why you could not submit, preferably with evidence (e.g. Doctor's note). If you are experiencing any difficulty that influences your attendance and/or performance in the course, please notify me asap to find a solution together.

Academic integrity: Please review Columbia's policy on academic integrity at www.college.columbia.edu/faculty/resourcesforinstructors/academicintegrity/statement. All students are expected to avoid plagiarism in all submitted work. All essay assignments will be checked for plagiarism. If you have questions about avoiding plagiarism, please contact me at the beginning of the semester. In case of plagiarism, you will receive 0 points for that assignment, and you will be reported to the Dean of Student Affairs. If you need assistance in writing, I highly recommend contacting the Writing Center (www.college.columbia.edu/core/uwp/writing-center). In case you experience any difficulties or time pressure, please contact me to find a solution rather than violating your academic integrity to prevent its serious consequences on your academic career.

Academic support: If you request any consideration regarding a disability, please inform me and Office for Disability Services (ODS) at the beginning of the semester and we would be happy to accommodate all the necessary arrangements. You can find how to register with ODS from https://health.columbia.edu/content/disability-services or 212-854-2388.

Curriculum fulfillment:

This seminar is designed for undergraduates majoring in Psychology or Neuroscience & Behavior, and for students participating in the Psychology Post-Baccalaureate Certificate program. It fulfills the following degree requirements:

- For the Psychology major or concentration in Columbia College and in the School of General Studies, and for the Psychology Post-Baccalaureate Certificate program, this course meets the Group 2 (Psychobiology & Neuroscience) distribution requirement.

- For the Neuroscience & Behavior joint major, it will fulfill the Psychology requirement for an advanced psychology seminar.

- For Psychology Post-Baccalaureate students and for Psychology majors, it will fulfill the seminar requirement.

PSYC 3495 Tentative Course Schedule*		
Week	**Date**	**Content**
1	Sept 3	Course overview / Gene-Environment Interactions
	Sept 5	Gene-Environment Interactions
2	Sept 10	Gene-Environment Interactions: Depression
	Sept 12	Gene-Environment Interactions: Challenges
3	Sept 17	Endophenotype Approach: Definitions and Comparisons
	Sept 19	Endophenotype Approach
4	Sept 24	Endophenotype Approach: Imaging
	Sept 26	Endophenotype Approach: Neuroendocrine & Immune
5	Oct 1	**Group Presentations #1**
	Oct 3	**Course Discussion #1:** GxEs and Endophenotype Approach
6	Oct 8	**Review paper topics feedback**
	Oct 10	Behavioral Epigenetics
7	Oct 15	Behavioral Epigenetics
	Oct 17	Behavioral Epigenetics
8	Oct 22	**Group Presentations #2**
	Oct 24	**Course Discussion #2:** Behavioral Epigenetics
9	Oct 29	Developmental Programming: Lifespan Approaches
	Oct 31	Developmental Programming: Health Disparities
10	Nov 5	*No class* - Academic Holiday
	Nov 7	Developmental Programming: Prenatal Effects
11	Nov 12	Developmental Programming: Intergenerational Effects
	Nov 14	**Course Discussion #3:** Developmental Programming
12	Nov 19	Looking ahead: Evolution
	Nov 21	Looking ahead: Prevention & Interventions
13	Nov 26	Looking ahead: Public Policy Implications
	Nov 28	*No class* - Thanksgiving
14	Dec 3	**Course Discussion #4:** Looking ahead
	Dec 5	Final wrap up (Final paper due 5pm)
** Schedule is subject to change anytime during the semester.*		