

SYLLABUS

1. Information about the study program

1.1 Higher education institution	Babeş-Bolyai University
1.2 Faculty	Faculty of Psychology and Educational Sciences
1.3 Department	Department of Psychology
1.4 Field of study	Psychology - Cognitive Sciences
1.5 Study cycle	Bachelor level
1.6 Study program / Qualification	Psychologist

2. Information about the course

2.1 Title of the course	Behavioral Genetics						
2.2 Teacher in charge of the lecture	Professor Andrei C. Miu, Ph.D.						
2.3 Teacher in charge of the seminar	Professor Andrei C. Miu, Ph.D.						
2.4 Study year	1	2.5 Semester	2	2.6. Examination type	E	2.7 Course type	DS

3. Estimated total time (number of hours of teaching activities per semester)

3.1 Number of hours per week	3	out of which: 3.2 lecture	2	3.3 seminar / laboratory	1
3.4 Total number of hours in the curriculum	42	out of which: 3.5 lecture	28	3.6 seminar / laboratory	14
Distribution of the allocated amount of time:					hours
Individual study (textbook, course support, bibliography, and notes)					25
Supplementary documentation at the library using specialized electronic platforms in the field					15
Preparing for seminars / laboratories, homework, papers, portfolios, and essays					14
Tutoring					2
Exams					2
Other activities: research activities					--
3.7 Total number of hours of individual study	58				
3.8 Total number of hours per semester	100				
3.9 Number of credits (ECTS)	4				

4. Prerequisites (if applicable)

4.1 Curriculum	Introduction to Neuroscience Quantitative Research Methods and Statistics
4.2 Competencies	-

5. Requirements (if applicable)

5.1 For the lecture	Classroom with at least 180 seats, computer and video projector / Online course conducted through the MS Teams platform.
5.2 For the seminar / laboratory	Room with at least 50 seats, computer and video projector / Online seminar conducted through the MS Teams platform.

6. Specific skills acquired

Professional skills	<p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Develops a general understanding of the genetic and environmental factors that contribute to individual differences in behavior • Becomes familiar with fundamental methods in behavioral genetics (e.g., twin studies, genetic association) <p>Explanation and interpretation</p> <ul style="list-style-type: none"> • Develops a correct interpretation of individual differences in behavior, as resulting from genetic and environmental differences <p>Instrumental - applicative</p> <ul style="list-style-type: none"> • Develops a basic understanding of interdisciplinary methods <p>Attitude</p> <ul style="list-style-type: none"> • Shows appreciation of the complex multifactorial nature of individual differences in behavior
Transversal skills	<p>Written and oral communication skills</p> <p>Relationship and teamwork skills'</p> <p>Time management skills and the management of resources</p>

7. Objectives of the course (based on the grid of acquired competencies)

7.1 General objective	<ul style="list-style-type: none"> • To understand the contribution of genetic and environmental factors to individual differences in behavior
7.2 Specific objectives	<ul style="list-style-type: none"> • To become familiar with some of the main methods that are used to study genetic and environmental influences on behavior • To understand fundamental concepts in genetics (e.g., DNA, gene, genome) • To gain basic knowledge on gene-environment interactions and correlations that

have been linked to individual differences in behavior (e.g., personality, intelligence, educational success, happiness)

8. Content

8.1 Lecture	Teaching strategies	Remarks
1. Behavioral genetics: History and current perspective	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
2. Mendelian inheritance	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
3. Non-Mendelian inheritance	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
4. Twin studies: Basic principles	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
5. Twin studies: Examples I	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
6. Twin studies: Examples I	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
7. Chromosomes and DNA	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
8. Transcription and translation	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
9. Candidate gene studies: Rise and fall	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
10. Gene \times environment interactions	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
11. Human genome	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
12. Genome-wide association studies: Principles	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
13. Genome-wide association studies: Examples	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--

14. Epigenetic regulation	Lecture, demonstrative example, synthesis of knowledge, guided discovery	--
<p>Mandatory references: Knopik, V. S., Neiderhiser, J. M., DeFries, J. C., & Plomin, R. (2017). <i>Behavioral genetics</i> (ed. a 7-a sau mai recentă). Worth Publishers, New York.</p> <p>Optional references: Carey, G. (2002). <i>Human genetics for the social sciences</i>. Sage publications. Miu, A. C., Homberg, J. R., & Lesch, K. P. (Eds.). (2019). <i>Genes, brain, and emotions: Interdisciplinary and Translational Perspectives</i>. Oxford University Press.</p>		
8.2 Seminar / laboratory	Teaching strategies	Remarks
Keywords:	Conceptual clarification, conversation, practical activities	--
1. Eugenics: A dark page in the history of genetics	Conceptual clarification, conversation, practical activities	--
2. The story of the rediscovery of Mendel's findings	Conceptual clarification, conversation, practical activities	--
2. Genomic imprinting: An exception to Mendelian inheritance	Conceptual clarification, conversation, practical activities	--
3. Ronald Fisher's view of heredity	Conceptual clarification, conversation, practical activities	--
4. What is a twin register?	Conceptual clarification, conversation, practical activities	--
5. Outlook of twin studies: part I	Conceptual clarification, conversation, practical activities	--
6. Outlook of twin studies: part I	Conceptual clarification, conversation, practical activities	--
7. How was the structure of DNA discovered?	Conceptual clarification, conversation, practical activities	--
8. The genetic code	Conceptual clarification, conversation, practical activities	--
9. Types of gene-environment interactions	Conceptual clarification, conversation, practical activities	--

10. Differential susceptibility	Conceptual clarification, conversation, practical activities	--
11. How many genes do we have?	Conceptual clarification, conversation, practical activities	--
12. GWAS: Limitations and outlook	Conceptual clarification, conversation, practical activities	--
13. GWAS in the study of mental health	Conceptual clarification, conversation, practical activities	--
14. Intergenerational epigenetic transmission: Critical perspective	Conceptual clarification, conversation, practical activities	--

Mandatory references:

Allen, G. E. (2001). Is a new eugenics afoot?. *Science*, 294(5540), 59-61.

Bodmer, W., Bailey, R. A., Charlesworth, B., Eyre-Walker, A., Farewell, V., Mead, A., & Senn, S. (2021). The outstanding scientist, RA Fisher: his views on eugenics and race. *Heredity*, 126(4), 565-576.

Ellis, B. J., Boyce, W. T., Belsky, J., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2011). Differential susceptibility to the environment: An evolutionary–neurodevelopmental theory. *Development and Psychopathology*, 23(1), 7-28.

Fairbanks, D. J. (2020). Mendel and Darwin: untangling a persistent enigma. *Heredity*, 124(2), 263-273.

Friedman, N. P., Banich, M. T., & Keller, M. C. (2021). Twin studies to GWAS: there and back again. *Trends in Cognitive Sciences*, 25(10), 855-869.

Horwitz, T., Lam, K., Chen, Y., Xia, Y., & Liu, C. (2019). A decade in psychiatric GWAS research. *Molecular Psychiatry*, 24(3), 378-389.

Ho-Shing, O., & Dulac, C. (2019). Influences of genomic imprinting on brain function and behavior. *Current Opinion in Behavioral Sciences*, 25, 66-76.

Jaffee, S. R., & Price, T. S. (2007). Gene–environment correlations: A review of the evidence and implications for prevention of mental illness. *Molecular Psychiatry*, 12(5), 432-442.

Odintsova, V. V., Willemsen, G., Dolan, C. V., Hottenga, J. J., Martin, N. G., Slagboom, P. E., ... & Boomsma, D. I. (2018). Establishing a twin register: An invaluable resource for (behavior) genetic, epidemiological, biomarker, and ‘omics’ studies. *Twin Research and Human Genetics*, 21(3), 239-252.

Polderman, T. J., Benyamin, B., De Leeuw, C. A., Sullivan, P. F., Van Bochoven, A., Visscher, P. M., & Posthuma, D. (2015). Meta-analysis of the heritability of human traits

based on fifty years of twin studies. *Nature Genetics*, 47(7), 702-709.

Portin, P. (2014). The birth and development of the DNA theory of inheritance: sixty years since the discovery of the structure of DNA. *Journal of Genetics*, 93(1), 293-302.

Salzberg, S. L. (2018). Open questions: How many genes do we have?. *BMC Biology*, 16(1), 1-3.

Optional references:

Boomsma, D., Busjahn, A., & Peltonen, L. (2002). Classical twin studies and beyond. *Nature Reviews Genetics*, 3(11), 872-882.

Dahm, R. (2005). Friedrich Miescher and the discovery of DNA. *Developmental Biology*, 278(2), 274-288.

Greenspan, R. J. (2008). The origins of behavioral genetics. *Current Biology*, 18(5), R192-R198.

Martin, N., Boomsma, D., & Machin, G. (1997). A twin-pronged attack on complex traits. *Nature Genetics*, 17(4), 387-392.

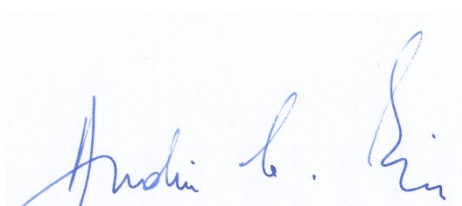
9. Correlations between the content of the course and the expectations of the representatives of the epistemic community, professional associations and representative employers in the field related to the program

Behavioral genetics has developed at the intersection of psychology and genetics, and offers a rich perspective on the genetic and environmental sources of individual differences. Theoretical and methodological training is indispensable for students of psychology, considering that any topic in psychology touches upon individual differences and their underlying mechanisms.

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Weight in the final grade
10.4 Lecture	Understanding basic concepts	Written exam	7/10
10.5 Seminar / laboratory	Reading the bibliography and participating in group discussions	Q&A	3/10
10.6 Minimum passing score: 5			
The final grade consists of: a. score obtained in the written exam in proportion of 70% b. seminar activity 30%			

Date

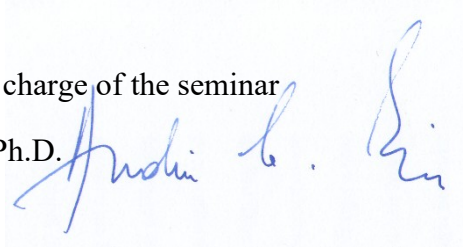


Signature of the teacher in charge of the lecture

Professor Andrei C. Miu, Ph.D.

Signature of the teacher in charge of the seminar

Professor Andrei C. Miu, Ph.D.

A handwritten signature in blue ink, appearing to read "Andrei C. Miu", is written over a light blue rectangular background.

Approval date in the department

Signature of the Head of the department /director

Professor Oana Benga, Ph.D.