

Detailed syllabus for the course:
BEHAVIORAL GENETICS

Academic year: 2026/2027

Study program: Master level program: Medical Chemistry, Drug Research and Development and Biotechnology in Medicine, YUFE Master level course

Course code: EBIL 140

ECTS credits: 3

Language of instruction: English

Course workload: 20 L + 10 S

Prerequisites for enrollment: Cell, molecular biology and genetics

Course coordinator and contact details:

Assoc. prof. Rozi Andretić Waldowski

R. Matejčić 2

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Consultation hours: TBD with student

Lecturers and teaching load: Assoc. Prof. Rozi Andretić Waldowski (55 hours)

Mandatory literature:

- Chaterine Baker „Behavioral Genetics“, AAAS 2004, e-book
<http://www.fulviofrisone.com/attachments/article/417/behavioral%20genetics.pdf>
- Research papers given during classes

Recommended literature:

- Behavioral Genetics: R.Plomin, J.C.DeFries, G.E.McClearn and M.Rutter, W.H.Freeman and Company, New York, 3rd Ed.

Course description:

This course will explain the genetic and environmental foundations of human behavior in the development of mental disorders, with emphasis on addiction. Students will explore how variations in the human genome contribute to behavioral phenotypes through mechanisms of heredity, environmental influence, and their dynamic interaction.

Key methodologies in behavioral genetics will be covered, including classical approaches such

as twin and adoption studies, modern genomic techniques like genome-wide association studies (GWAS), and functional genomics. The acquired knowledge will be essential for understanding scientific papers that investigate the heritability and environmental influence on cognitive abilities and susceptibility to the development of addiction. The biological mechanisms of environmental influence will be presented through the effects that epigenetic modification has on gene expression. Students will gain insight into how experiences and exposures can lead to lasting biological changes that influence behavior across the lifespan. The course will introduce students to the ethical, legal, and social implications of studies in behavioral genetics. Topics such as genetic determinism, privacy concerns, and the use of genetic information in legal and clinical contexts (genetic counselling) will be analyzed through seminars and guided debates.

By the end of the course, students will be able to interpret genetic research in the field of behavioral genetics, evaluate its implications for health and society, and apply this knowledge in interdisciplinary contexts.

Learning outcomes:

1. Identify central concepts in genetics
2. Understand the complex role that genetic makeup and environment play in the expression of human behavior

At the end of the course students should be able to

1. Describe concepts in genetics, such as inheritance, simple and complex traits, genetic material, and epigenetic modifications.
2. List the methodology used in behavioral genetics and types of research on animals and humans.
3. Describe the influence of genetic makeup and environment on the expression of human traits.
4. Use the acquired knowledge to discuss research papers in the field of human behavioral genetics
5. Debate the ethical, moral and social consequences of research in the field of human behavioral genetics

Detailed course content:

Lectures:

- L1. Genetic Architecture of Behavior (4h)
- L2. Twin, Adoption, and Family Studies (2h)
- L3. Molecular Genetics and GWAS (2h)
- L4. Epigenetics and Behavioral Regulation (2h)
- L5. Genetics of Cognitive Functioning (2h)
- L6. Gene-Environment Interplay (2h)
- L7. Ethical, Legal, and Social Implications (2h)

L8. Behavioral Genetics in Public Health (2h)

L9. Genetic Counseling (2h)

Seminars:

S1. Simple and complex human traits (1h)

S2. Gene-environment interaction (1h)

S3. Epigenetic influence on human traits (1h)

S4. Epigenetic role in mental diseases (1h)

S5. Studies of complex human traits in model organisms (2h)

S6. Addiction: genetics, epigenetics, environment (2h)

S7. Ethical concerns of gene editing (2h)

Obligations, monitoring and student assessment:

Exam dates:

1st exam date is 15.05.2026.

2nd exam date is according to agreed date with the student

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Grading criteria (according to Pravilnik o studijima Sveučilišta u Rijeci):

Students can earn a maximum of 70% of points during lectures and seminars, and 30% on the final exam. Seminars will have form of question and answer session based on the assigned reading. During seminars, students will be assessed for: understanding of the assigned reading, independent reporting of acquired information and productive participation in discussions and debates. For each seminar, students can earn a maximum of 10 points. Students are expected to attend the class and actively participate with questions and comments about the lectures.

Students are expected to have their video feed turned on during the entire class, otherwise they will be considered not present.

Students can take the final exam if they have acquired more than 35 points during classes. The final exam will be oral, where each student will pick a number associated with a question. The student will have to elaborate on the answer in the context of the material covered in class. A maximum of 30 points will be given for an answers showing that the student has achieved the expected learning outcomes. For a passing grade, 15 points must be collected. The final grade is based on the sum of percentage points accumulated during the course and on the final exam. Passing grades are satisfactory (2) or above.

Percentage score	ECTS grade	Numerical grade
90% to 100%	A	Excellent (5)
75% to 89.9%	B	Very good (4)
60% to 74.9%	C	Good (3)

50% to 59.9% D Satisfactory (2)
0% to 49.9% F Unsatisfactory (1)

Class schedule:

Date	Group	Time	Place	Content	Lecturer
05.03.2027.	all	16:00-19:00	On-line	L1	Assoc. prof. Andretić W.
12.03.2027.	all	16:00-19:00	On-line	L2, S1	Assoc. prof. Andretić W.
19.03.2027.	all	16:00-19:00	On-line	L3, S2	Assoc. prof. Andretić W.
02.04.2027.	all	16:00-19:00	On-line	L4, S3	Assoc. prof. Andretić W.
09.04.2027.	all	16:00-19:00	On-line	L5, S4	Assoc. prof. Andretić W.
16.04.2027.	all	16:00-19:00	On-line	L6, S5	Assoc. prof. Andretić W.
23.04.2027.	all	16:00-19:00	On-line	L7, S6	Assoc. prof. Andretić W.
07.05.2026.	all	16:00-19:00	On-line	L8, S7	Assoc. prof. Andretić W.
14.05.2026.	all	16:00-19:00	On-line	Exam	Assoc. prof. Andretić W.

Academic integrity:

During the class and the exam, students are expected to behave according to the highest standards of integrity and ethical behavior. In addition, students can refer to the documents: Etički kodeks Sveučilišta u Rijeci and Etički kodeks za studente.

During classes, students are expected to show fairness in interactions, respect for each other's efforts, and fair acknowledgment of the contributions of others. Academic dishonesty, such as presenting the work of others as the student's own, use of AI-generated content without proper acknowledgment, and material produced in collaboration with others (unless explicitly permitted), will be punished by no grade for the given assignment and the breach of ethical conduct will be reported to the Ethical Committee of the FABRI.