

Psychogenetics

Code: 102584
ECTS Credits: 6

Degree	Type	Year	Semester
2502443 Psychology	OT	4	1

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Other comments on languages

Teaching is in Catalan and the materials and bibliography are mostly in English

Prerequisites

Knowledge of biological bases of behaviour and the mind, so it is necessary to know the components and functioning of the nervous and endocrine systems, as well as to understand fundamental genetic mechanisms. A solid knowledge of the basic rules of nervous system functioning, neuropsychological mechanisms underlying psychological processes as well as normal and pathological behaviours allow students to understand the inheritance mechanisms underpinning both behavioural and mental disorders.

Objectives and Contextualisation

Psychology is an incredibly rich discipline, including aspects related to health, society, education, work, justice, etc. Knowledge of behaviour and the mind requires, among others, an understanding of the biological bases that support them. This is the goal of psychobiology in general and of several optional subjects in the 4th year.

Training objectives for Behavioural Genetics are:

- Understand that human behaviour is the result of an aggregation of complex multifactorial traits.
- Understand that some abnormal behavioural traits and some disorders have been linked to single-gene mutations.
- Knowledge of common variations in DNA.
- Knowledge of the main strategies and methodologies used in Behavioural Genomics and Epigenomics.
- Understand the crucial role of interactions (and correlations) between genome and environmental risk factors and between genome and protective environments.
- Understand that the epigenetic code allows certain types of information to be passed to offspring.

- Identify and describe the potential of genetic therapy.
- Understand the role of a psychologist in multidisciplinary genetic counselling teams.

Competences

- Analyse scientific texts written in English.
- Develop strategies for autonomous learning.
- Identify, describe and relate the biology of human behaviour and psychological functions.
- Maintain a favourable attitude towards the permanent updating through critical evaluation of scientific documentation, taking into account its origin, situating it in an epistemological framework and identifying and contrasting its contributions in relation to the available disciplinary knowledge.
- Make systematic reviews of the different documentary sources in psychology to collect, order and classify research data and materials.
- Use different ICTs for different purposes.
- Work in a team.

Learning Outcomes

1. Analyse scientific texts written in English.
2. Analyse, synthesize and summarise information from scientific and professional texts.
3. Demonstrate a knowledge of the importance of interaction (and correlation) among generic factors and risk factors and between those and protective environmental factors.
4. Demonstrate an understanding of the importance of the role of the psychologist in a multidisciplinary team for genetic counselling.
5. Develop strategies for autonomous learning.
6. Handle scientific documentation systems.
7. Identify and describe the main study methods and strategies in behavioural genetics.
8. Identify and describe the potential for genetic therapy.
9. Identify the nature of genetic contribution to the main psychopathologies and neurological illnesses.
10. Maintain a favourable attitude towards the permanent updating through critical evaluation of scientific documentation, taking into account its origin, situating it in an epistemological framework and identifying and contrasting its contributions in relation to the available disciplinary knowledge.
11. Plan a literature search or references, both computerized databases and libraries and newspaper archives.
12. Use different ICTs for different purposes.
13. Use knowledge acquired to apply to genetic counselling, justifying the action in each case.
14. Work in a team.

Content

Unit 1: Behavioural Genomics and Epigenomics.

Unit 2: Strategies and methods in Behavioural Genomics and Epigenomics
-Use of sex as a biological variable.

Unit 3: Ethics and gene therapy.

Unit 4: Genetic Counselling.

Unit 5: The genetic etiology of complex human traits

Unit 6: Genetic factors and epigenetics mechanisms in addictions.

Unit 7: Complex and non-Mendelian diseases

Unit 8: Genetic variations and epigenetic factors in cognitive disability.

Unit 9: Alzheimer disease: Genetic factors of complex and heterogeneous diseases

Unit 10: Huntington disease: a single-gene Mendelian disease

Methodology

The teaching methodology is based on different types of training activities. Depending on the case, master classes, seminars, supervised and autonomous activities will be carried out. Different activities based on student-focused active learning methodologies involving problem solving are also proposed.

N.B. The proposed teaching and assessment methodologies may experience some modifications as a result of the restrictions on face-to-face learning imposed by the health authorities. The teaching staff will use the Moodle classroom or the usual communication channel to specify whether the different directed and assessment activities are to be carried out on site or online, as instructed by the Faculty.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Master classes (whole group)	24	0.96	3, 7, 8, 9
Seminars	12	0.48	3, 4, 7, 8, 9, 13
Type: Supervised			
Group-based work	2.5	0.1	
Tutorials (on line and one-to-one)	3	0.12	
Type: Autonomous			
Documentation	5	0.2	5, 14
Reading scientific texts	42	1.68	1, 10, 12
Study	45.5	1.82	3, 4, 7, 8, 9, 13
Writing and preparing works	12	0.48	12

Assessment

Assessment (learning evidences)

The assessment guidelines of the Faculty of Psychology can be found at the following link:

<https://www.uab.cat/web/estudiar/graus/graus/avaluacions-1345722525858.html>

According to "The assessment guidelines of the Faculty of Psychology" (see above), the subject will be assessed based on the following learning evidences (EV):

EV1 (40% of the final grade): Content of Units 1 to 6 (except Unit 4) (open questions) will be assessed. The test takes place the first assessment week.

EV2: Continuous feedback activities (team-based work) (10 % of the final grade). Continuously throughout the semester.

EV3: Genome x Environment study (team-based work and orally) (10 % of the final grade). Presentations take place during the last weeks of seminars.

EV4: (40% of the final grade): Content of Units 4 and 7 to 13 (open questions) will be assessed. The test takes place the second evaluation week.

Total grade

The total grade is obtained from the weighted average of EV1 to EV4 grades. In order to pass the course, it is mandatory that the weighted average of all grades (EV1 to EV4) will be equal to or greater than 5 and the weighted average of EV1 and EV4 is higher 3.9 (out 10).

Reassessment

In order to be allowed to do the reassessment test, the students are required to have completed learning evidences with a weight equal or greater than 2/3 for the whole subject and have obtained a mark lower 5 (out of 10) in total grade. Reassessment will consist of an exam of open questions about all units. EV2 and EV3 are excluded of reassessment. The maximum grade that can be obtained in this recovery is 5 (out of 10).

Subject passed

The subject will be considered passed when the weighted average of all grades (EV1 to EV4) is equal to or greater than 5 and the weighted average of EV1 and EV4 is higher 3.9 (out 10) or the reassessment qualification is 5. In case of not achieving the established requirements the maximum grade to consign in the academic transcript will be of 4.9 points.

Definition of "Non-assessable student"

Students who have not performed any of the assessment tests or have completed learning evidences with a weight lower than 40% for the whole subject will be marked as "Non-assessable" Grade.

No unique final synthesis test for students who enrol for the second time or more is anticipated.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
EV 1: Exam	40	2	0.08	3, 5, 7, 8, 9
EV 4: Exam	40	2	0.08	3, 4, 5, 7, 9, 13
EV2: Continuous feedback activities (group-based)	10	0	0	1, 2, 6, 10, 14, 12
EV3: Genome x Environment study (group-based)	10	0	0	1, 2, 5, 7, 9, 11, 14

Bibliography

FUNDAMENTAL BIBLIOGRAPHY

Caspi, Avashlom; Moffitt, Terrie E: Gene-environment interactions in psychiatry: joining forces with neuroscience. *Nat Rev Neurosci.* 7(7): 583-590, 2006

Champagne, Frances A: Beyond the maternal epigenetic legacy. *Nat Neurosci.* 21:773-774, 2018

Clayton, Janine A: Applying the new SABV (sex as a biological variable) policy to research and clinical care. *Physiology & Behavior* 187: 2-5, 2018

Halldorsdottir, Thorhildur; Binder, Elisabeth B: Gene × Environment Interactions: From Molecular Mechanisms to Behavior. *Annu Rev Psychol.* 68 :215- 241:215-241, 2017

Hamer, Dan: Rethinking behavior genetics. *Science* 298 (5591):71-72, 2002

Holden, Constance: Parsing the genetics of behavior. *Science* 322 (5903) 892-895, 2008

Isles, Anthony R: Neural and behavioral epigenetics; what it is, and what is hype. *Genes, Brain and Behavior* 14(1): 64-72, 2015

Martí Carbonell, Sunsi; Darbra, Sònia : *Genètica del comportament*. Bellaterra: Servei de Publicacions UAB. 2006.

Miller, Glenn: The seductive allure of behavioral epigenetics. *Science* 329(5987) : 24-27, 2010

Sweatt, J David: Experience-dependent epigenetic modifications in the central nervous system. *Biological Psychiatry* 65:191-197, 2009

COMPLEMENTARY BIBLIOGRAPHY

Clayton, Janine A: Applying the new SABV (sex as a biological variable) policy to research and clinical care. *Physiology & Behavior* 187: 2-5, 2018