1. BASIC INFORMATION

Subject	Biology of Behavior
Degree program	Psychology
School	Biomedical Sciences
Year	1st
ECTS	6
Credit type	Basic
Language/s	English
Delivery mode	Face-to-face
Semester	S1
Academic year	2025/2026
Coordinating professor	Beatriz Navarro Galve
Professor	Nuria Saiz and Inmaculada González

2. INTRODUCTION

The Biology of Behavior course provides students with the biological foundations of the nervous system and its functioning. Throughout the course, concepts of cellular biology and genetics will be addressed, which are fundamental for understanding the elements that make up our nervous system and explain how our genetic information and environment shape our biology and behavior. Finally, an overview of the methodology that allows us to conduct basic, preclinical, and clinical research to understand the nervous system is provided.

3. LEARNING OUTCOMES

Knowledge

CON08: Characterising the different attentional networks, their neuroanatomical bases, the experimental paradigms used to evaluate them, and the various neuropsychological diagnoses associated with them.

- Describing the fundamentals of cellular signalling and communication, and the fundamental principles of molecular biology.
- Identifying the mechanisms of cell division and gamete formation.
- Describing the basic principles of the laws of inheritance and the principles of epigenetics.
- Describing the concept of evolutionary process and the influence of biological evolution on human behaviour.

Skills

HAB07: Analysing the contribution of biological, cultural, and psychosocial foundations to the development of psychological differences in both individuals and groups.

Analysing the biological bases of behaviour and their relationship with environmental influences.

Practicing the main basic laboratory techniques.

Competencies

COMP01: Understanding the functions, characteristics, and limitations of the different theoretical models of Psychology in the field of Health Psychology.

COMP02: Understanding the basic laws of the various psychological processes in the field of Health Psychology.

COMP03: Understanding the main processes and stages of psychological development throughout the life cycle in their aspects of normality and abnormality in the field of Health Psychology.

COMP04: Understanding the biological foundations of human behaviour and psychological functions.

COMP13: Being able to describe and measure variables (personality, intelligence, and other aptitudes, attitudes, etc.) and cognitive, emotional, psychobiological, and behavioural processes.

COMP27: Knowing how to apply direct intervention strategies and methods to recipients: psychological counselling, therapy, negotiation, mediation...

4. CONTENTS

Block I: Biological bases of behaviour

Unit 1. Introduction to Psychobiology 1. Ethology: Tinbergen's four questions. 2. Extended conception of psychobiology.

Unit 2. Bases of cellular communication 1. Levels of cellular organisation. 2. Eukaryotic cell. 3. Cellular transport and communication.

Block II: Molecular and cellular bases of inheritance

Unit 3. Cellular machinery. 1. DNA. 2. RNA. 3. Dogma of molecular biology: transcription, protein translation, and genetic code.

Unit 4. Cell cycle and mitosis. 1. Cell cycle. 2. Chromosomes. 3. Cell division: mitosis.

Unit 5. Formation of germ cells: meiosis. 1.Phases of meiosis. 2. Genetic variability. 3. Formation of gametes. 4. Fertilisation.

Block III: Embryonic development and inheritance patterns.

Unit 6. Development and neuroplasticity 1. Early development, critical periods, and developmental plasticity. 2. Development of malleability in adulthood. 3. Brain damage. 4. Plastic responses to brain damage.

Unit 7. Bases of molecular genetics and inheritance patterns. 1. Basic terminology. 2. Mendelian genetics. 3. Modifications of the Mendelian principles. 4. Chromosomal theory of inheritance. 5. Inheritance patterns. 6. Chromosomal mutations.

Unit 8. Epigenetics: Gene-environment interaction. 1. Bases of epigenetics. 2. Genetics, environment, and evolution. 3. Effects of maternal care on the genetic expression of humans.

Block IV: Biological bases of behaviour

Unit 9. Animal models in research. 1. Design of animal models in research. 2. Animal models in CNS disorders.

Unit 10. Biological bases of behaviour 1. Evolutionary theory and predetermined behaviour. 2. Genetic selection or gene-environment relationships. 3. Genetics, environment, and evolution.

5. TEACHING-LEARNING METHODOLOGIES

The following types of teaching-learning methodologies will be applied:

- Lectures
- Student presentations
- Practical work
- Problem-based learning (PBL)

6. LEARNING ACTIVITIES

The following table shows the types of formative activities which will be carried out, along with the number of student hours dedicated to each:

Assessment activity	Number of hours
Lectures	23h
Conferences	5h
Asynchronous lectures	7h
Problem solving	15h
Workshops and/or laboratory activities	20h
On-site tutorial sessions	5h
Autonomous work	50h
Practical exervises	10h

Formative assessment	3h
Research	10h
On-site knowledge assessments	2h
Total	150h

7. ASSESSMENT

Below are the assessment systems and their corresponding weight in the overall course grade:

Assessment system	Weight
Knowledge tests: Combined exam with 30 multiple-choice questions (70% of the exam grade) and short-answer questions (30% of the exam grade).	50 %
Case analysis and problem-solving: Activities carried out in the subject throughout the course. As part of this component (in Activity 2), a horizontally integrated curriculum activity will be conducted in coordination with the subject of Social Psychology, as well as vertically integrated with subjects in later years. 1. Virtual Labster activity (1%) 2. Activity on intersexuality (4%): Includes a virtual lab and a quiz on audiovisual material, completed through CANVAS.	5 %
Reports and written assignments: PBL (Project-Based Learning) with practical activities, including 4 curriculum-integrated activities with content from basic subjects (Anatomy and Physiology): 1. Scientific culture project: Attendance at lab sessions and a group oral presentation will be assessed (5%). 2. Seminar: *Animal models in neuroscience research*. Attendance is mandatory. Participation will be assessed through a preparatory activity (5%). 3. Practical lab session (5%): Attendance and participation will be assessed through a quiz. 4. A group written report on an animal model based on a case study (10%).	25 %
Student laboratory report: Independent preparatory work for the 5 laboratory sessions, assessed through pre-lab quizzes.	10%
Laboratory practices/Virtual simulated environments: Attendance and participation in the 5 lab sessions, assessed through quizzes at the end of each session.	10 %

When you access the course on the Virtual Campus, you will find detailed information about the assessment activities you must complete, including submission deadlines and evaluation procedures for each one.

Attendance

As established in the University's official degree assessment regulations, Title I, art. 4, "For students enrolled in on-site courses, it is mandatory to justify at least 50% attendance in classes as a necessary part of the assessment process and to fulfill the student's right to receive guidance, assistance, and academic supervision from the teacher." Failure to provide evidence of at least 50% attendance through the means proposed by the university will allow the teacher to grade the course as failed in the regular call.

Students who have not met the 50% attendance requirement in the regular call may be graded as failed and will need to pass the corresponding objective tests in the extraordinary call, where they must obtain a grade of 5.0 out of 10 or higher.

7.1. Ordinary call

To pass the course in the ordinary call, you must obtain a grade of 5.0 out of 10 or higher in the final grade (weighted average) of the course. The student's final grade will be obtained from the weighting of the partial grades of each block (knowledge test and active methodologies) as indicated below. The grades published in the virtual campus will be provisional until the test review is completed.

To pass the course, you must obtain a grade of 5.0 out of 10 or higher in the following sections:

- In the **knowledge test** (final exam of the course).
- In the **active learning block** (case analysis and problem-solving, reports and writings, laboratory practices, and student report of practical sessions).
- In the **final grade of the course** (weighted average): 50% active methodologies block and 50% theory block (knowledge test).

If any of the course blocks are not passed, and therefore the course is failed, the grade recorded will always be that of the block with the lowest score.

In case of a change in the evaluation date, according to the application of the UEM regulations for changing the date of evaluable tests, the format of the test may vary from that of the general call.

PLAGIARISM AND USE OF AI

Any student who resorts to or uses illicit means during an evaluation test, or who improperly claims authorship of academic work required for assessment, will receive a failing grade ("0") in all evaluation tests for the exam period in said subject in which the violation occurred, and may also face disciplinary action following the opening of a disciplinary proceeding.

AI-generated content: AI-generated content tools (AIGC), such as ChatGPT and other language models (LLMs), cannot be used to generate work. These tools also cannot be held responsible for the content written in the work. The use of AI must be authorized by the instructor for each activity. If a student has used these tools to develop any part of their work, their use must be described in detail in the work. The student is entirely responsible for the accuracy of the information provided by the tool and for correctly

referencing any supporting work. Tools used for improving spelling, grammar, and general editing are not included in these guidelines. The final decision on the appropriateness of reported AI tool usage rests with the instructor, academic coordinator, and program director.

Delay in submitting mandatory activities

Late submission of mandatory assignments will result in the activity not being assessed, and a numerical grade of 0 will be assigned.

Laboratory practices

Mandatory Uniform Use: To participate in laboratory sessions, students are required to wear the full uniform (Lab coat). Any student who does not attend with the complete uniform will not be allowed to take part in the session and will receive a grade of 0 for the corresponding assessment activities

Justified absences: If a student is unable to attend a laboratory session due to a justified reason (as defined in the official regulations), they must inform the instructor in advance. Whenever possible, efforts will be made to reassign the student to another group.

If reassignment is not possible, only one justified absence will be allowed during the laboratory sessions. In such a case, the final grade will be calculated as the weighted average of the completed sessions, excluding the justified absence. Only one justified absence will be accepted. Any additional absence, whether justified or not, will be graded with a 0 and will be included in the calculation of the final grade.

Final Grade Calculation: The final grade for the laboratory component will be based on the weighted average of all completed sessions, taking into account the conditions described above.

7.2. Extraordinary call

To pass the course in the extraordinary call, the same requirements as in the ordinary call must be met.

To pass the course in the extraordinary call, you must obtain a final weighted grade of 5.0 out of 10.0 or higher. It is also required to obtain a minimum grade of 5.0 in both the exam and the weighted average of the active learning components. If the grade in either of these components (exam or active learning activities) is below 5.0, the course will be considered as failed. The grades published on the Virtual Campus will be provisional until the review of the exam has taken place.

To pass the course, it is necessary to obtain a grade equal to or greater than 5.0 out of 10.0 in the following sections:

- in the knowledge test (final exam of the course),
- in the active learning block (case analysis and problem-solving, reports and written assignments, laboratory practices, and student lab report),
- in the final grade of the course (weighted average): 50% active learning block and 50% theory block (knowledge test).

In the event of a change in the exam date, according to the application of the UEM regulations for rescheduling assessment tests, the format of the exam may differ from that of the general examination session.

The retake of the laboratory practices will be carried out through a practical session during the extraordinary period, in which the main practical skills to be acquired will be assessed, along with an objective test on the content of the laboratory practices.

8. SCHEDULE

This section indicates the schedule with submission dates for the assessable activities of the course:

Assessment activities	Date
Formative assessment: online evaluable questionnaire	Week 3, 6, 9, 12 y 14
Laboratory practices / practices in virtual simulated environments	Week 5,8,10, 11 y 13
PBL Project	Week 10 - 14
Course activities	Week 4 y 11
Objective exam	Week 16

This schedule may be subject to changes due to logistical reasons. Any modifications will be communicated to the student in due time.

9. BIBLIOGRAPHY

The following is recommended reading:

- Alberts, B., Johnson, A., Lewis, J., Morgan, D., Raff, M., Roberts, K., & Walter, P. (2019). *Essential cell biology* (5th ed.). W. W. Norton & Company.
- Cooper, G. M. (2013). *The cell: A molecular approach* (6th ed.). Sinauer Associates.
- Pierce, B. A. (2011). *Fundamentos de genética: conceptos y relaciones*. Editorial Médica Panamericana.
- Pinel, J. P. J. (2007). *Biopsicología* (6ª ed.). Pearson Educación.
- Lodish, H., Berk, A., Kaiser, C. A., Krieger, M., Bretscher, A., Ploegh, H., & Matsudaira, P. (2016). *Molecular cell biology* (8th ed.). W. H. Freeman.
- Sadava, D., Hillis, D. M., Heller, H. C., & Berenbaum, M. R. (2019). *Life: The science of biology* (11th ed.). W. H. Freeman.

10. EDUCATIONAL ORIENTATION AND DIVERSITY UNIT

The Educational Orientation and Diversity Unit (ODI) provides support to students throughout their university life to help them achieve their academic goals. Other pillars of our work include the inclusion of students with specific educational support needs, universal accessibility on the university campuses, and equal opportunities.

This Unit offers students:

1. Support and monitoring through personalized advising and plans for students needing to improve their academic performance.
2. In terms of diversity, non-significant curricular adjustments are made, i.e., at the level of methodology and evaluation, for students with specific educational support needs, aiming for equal opportunities for all students.
3. Various extracurricular training resources to develop diverse skills that will enrich their personal and professional development.
4. Vocational guidance by providing tools and advising to students with vocational doubts or those who believe they have chosen the wrong program.

Students needing educational support can contact us at: orientacioneducativa@universidadeuropea.es

11. SATISFACTION SURVEYS

Your opinion matters!

Universidad Europea encourages you to participate in satisfaction surveys to identify strengths and areas for improvement regarding the faculty, the degree program, and the teaching-learning process.

The surveys will be available in the survey section of your Virtual Campus or sent to your email.

Your feedback is essential to improve the quality of the degree program.

Thank you very much for your participation.