

**COURSE DATA****Data Subject**

<b>Code</b>	33296
<b>Name</b>	Fundamentals of psychobiology
<b>Cycle</b>	Grade
<b>ECTS Credits</b>	6.0
<b>Academic year</b>	2021 - 2022

**Study (s)**

<b>Degree</b>	<b>Center</b>	<b>Acad. year</b>	<b>Period</b>
1319 - Degree in Psychology	Faculty of Psychology and Speech Therapy	1	First term

**Subject-matter**

<b>Degree</b>	<b>Subject-matter</b>	<b>Character</b>
1319 - Degree in Psychology	1 - Biology	Basic Training

**Coordination**

<b>Name</b>	<b>Department</b>
COSTA FERRER, RAQUEL	268 - Psychobiology

**SUMMARY**

Foundations of Psychobiology (FP) is a basic course. Here, basic should be understood as essential. The students will achieve the necessary knowledge to undertake the forthcoming courses in the field of Psychobiology (Physiological Psychology I and II, Psychopharmacology, Psychoendocrinology, Neuropsychology, Psychobiological Bases Applied to Social Intervention, Psychobiology of Stress). Furthermore, the knowledge and skills acquired in FP will be useful for courses in areas other than Psychobiology, where motivation, learning, language, psychopathology and other issues are studied, since they have strong biological bases.

FP deals with three broad areas: the genetics of behavior, neurophysiology and neuroanatomy. The study of these fields gives the student scientific habits that will be very helpful when working as a professional in any area of Psychology.



## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

### Other requirements

#### RECOMMENDATIONS:

Basic knowledge in Biology such as that acquired in the Bachiller of Health Sciences is considered convenient. Being familiar with standard software packages is recommended.

## OUTCOMES

### 1319 - Degree in Psychology

- Students must have acquired knowledge and understanding in a specific field of study, on the basis of general secondary education and at a level that includes mainly knowledge drawn from advanced textbooks, but also some cutting-edge knowledge in their field of study.
- Students must be able to communicate information, ideas, problems and solutions to both expert and lay audiences.
- Be able to describe and measure variables (personality, intelligence, attitudes, aptitudes, etc.) and cognitive, emotional, psychobiological and behavioural processes.
- Be able to plan the assessment of programmes and interventions.
- Know how to analyse and interpret the results of assessment.
- Know and comply with professional ethics of Psychology.
- Understand the biological foundations of human behaviour and psychological functions.

## LEARNING OUTCOMES

Goal 1: Students will be able to place Psychobiology in the fields of Psychology and Neuroscience.

Goal 2: Students will be able to identify and specify the main research methods used in Psychobiology.

Goal 3: Students will be able to differentiate among the types of genetic transmission, and identify the hereditary pattern.

Goal 4: Students will be able to identify the types of nervous cells.

Goal 5: Students will be able to describe how the nervous system processes information.

Goal 6: Students will be able to describe the bases of chemical communication at the synapses.



Goal 7: Students will be able to describe the mechanisms of action of neurotransmitters and psychotropic medications.

Goal 8: Students will be able to locate the main structures of the nervous system on a diagram.

Goal 9: Students will be able to relate the main structures of the nervous system with their functions.

Goal 10: Students will be able to relate the nervous system to the other control systems.

## DESCRIPTION OF CONTENTS

### 1. Introduction to Psychobiology

#### 1. Introduction

Historic frame of Psychobiology: past and present. Method and techniques of research in Psychobiology. A biological explanation of the human mind.

### 2. Genetics of behavior, Evolution and Ethology.

#### 2. Genetics of behavior

Cellular and molecular bases of Genetics. Types of genetic transmission. Mendelian Genetics. Polygenic inheritance. Gene-environment interaction.

#### 3. Evolution

History of theories of evolution. Theory of evolution by natural selection. Theory of evolution at present. Psychology and theory of evolution.

#### 4. Ethology

Definition and history. Ethology and Comparative Psychology. Function of behavior.

### 3. Cells of the nervous system: eststructure and function

#### 5. Cells of the nervous system

Hierarchical organization of life. Control systems. Anatomy of neurons. Glial cells. Histological techniques for the study of the central nervous system.

#### 6. Bases of information processing in nervous cells

Resting membrane potential. Action potential: ionic basis, generation, conduction. Types of nerve fibers.

**4. Chemical communication****7. Neuronal communication**

Structure and types of synapses. Synaptic transmission. Types of receptors. Postsynaptic potentials.

**8. Neurotransmission systems**

Chemical messengers: neurotransmitters and neuromodulators. Types of neurotransmitters. Acetylcholine. Dopamine. Adrenaline. Noradrenalin. Serotonin. GABA. Glutamate. Neuropeptides. Other neurotransmitters. Mechanisms of action of psychotropic medications.

**5. Nervous System anatomy****9. General layout of the human nervous system**

Directions in the vertebrate nervous system. Protections of the central nervous system: meninges, ventricles, cerebrospinal fluid, and blood-brain barrier. Cerebrovascular system.

**10. Anatomical and functional organization of the nervous system**

Macroscopic anatomy of the central and peripheral nervous system. Spinal cord. Myelencephalon. Metencephalon. Mesencephalon. Diencephalon. Telencephalon.

**11. Autonomic nervous system** Sympathetic nervous system. Parasympathetic nervous system. Similarities and differences between them. Vegetative functions.

**12. Relationship of nervous system with other control systems**

Anatomy and messengers of the endocrine system. Anatomy and messengers of the immune system. Relationship among the nervous, endocrine and immune systems.

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theoretical and practical classes	60,00	100
Attendance at events and external activities	10,00	0
Development of group work	15,00	0
Development of individual work	10,00	0
Study and independent work	30,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	5,00	0
Preparing lectures	10,00	0
Preparation of practical classes and problem	5,00	0
<b>TOTAL</b>	<b>150,00</b>	



## TEACHING METHODOLOGY

Active and participative methodology, integrating different instructional methods to enhance the significant learning of the knowledge and the development involved the goals of the field.

Among the basic instructional techniques it is included (1) Exhibitions and presentations of the contents of the subject, (2) Performance of practical activities (anatomical models, use of optical microscopes), (3) scheduled group tutoring, (4) Preparation of papers independently, reports of the practical sessions (individual and grouped), (5) formative and summative evaluation.

## EVALUATION

### Minimum requirements

To pass the course is necessary to reach 50% of the maximum score.

#### ES1-Exams (80%)

1. Test on the level of knowledge acquired by the student through an exam. It will be necessary to obtain at least 4.5 out of 10 to continue with the correction of practical skills
2. Test on the level of practical skills acquired by the student, through an examination that involves solving problems similar to those raised in the classes.

#### ES2-Reports and activities throughout the course (20%)

Assessment of work involving the student has developed skills of knowledge; understanding and application of the contents of the subject will constitute 20% of the final grade.

In the case of the practices, the activities derived from them, are considered non-recoverable due to the work dynamics (such as, for example, the rabbit brain's dissection or the microscope visualization of histological preparations).

As a minimum, it will be necessary to reach half of the possible mark in both the theoretical and practical examination.

### WARNING

**1) Evidence of copying or plagiarism** in any of the assessable tasks will result in failure to pass the subject and in appropriate disciplinary action being taken. Please note that, in accordance with article 13. d) of the Statute of the University Student (RD 1791/2010, of 30 December), it is the duty of students to refrain from using or participating in dishonest means in assessment tests, assignments or university official documents.





During tutorials, lecturers may require individual or group interviews in order to verify the degree of participation and achievement of goals for any given task. Failure to accept the verification will result in such task or activity being failed.

**2) GRADING SCHEME.** Grades shall be subject to the provisions of the University of Valencia Regulations on Marks (ACGUV 108/2017).

([http://www.uv.es/graus/normatives/2017\\_108\\_Reglament\\_avaluacio\\_qualificacio.pdf](http://www.uv.es/graus/normatives/2017_108_Reglament_avaluacio_qualificacio.pdf))

According to this, subjects are graded on a scale of 0 to 10 points to one decimal place, followed by a qualitative equivalence:

- From 0 to 4.9: fail.
- From 5 to 6.9: pass
- From 7 to 8.9: good.
- From 9 to 10: excellent or excellent with distinction.

Excellent with distinction will be in order of mark (from highest to lowest). In case of tie, an exam will be carried out. The teacher will specify the specific characteristics.

The different elements of assessment will only count towards the final aggregate mark if the minimum requirements established for each element are met.

Subject records will include the mark obtained at the first attempt according to the following rules:

- If the element of assessment with the highest weighting has not been assessed, the subject will be graded as ABSENT, irrespective of the rest.
- If the element of assessment with the highest weighting has been assessed but it does not meet minimum requirements, the subject will be given a mark of FAIL and the numerical mark on the 0-10 scale for that element.
- If the element of assessment with the highest weighting has been assessed and it does meet minimum requirements but any of the remaining elements does not, the subject will be given a mark of FAIL and the numerical mark on the 0-10 scale for the element failed.

For the **second attempt**, the following rules shall apply:

- The practical activities and works presented marks are maintained.
- The mark of ABSENT can only be awarded when more than one element of assessment including that with the highest weighting has not been assessed.
- If all the elements of assessment have been assessed but one of them does not meet minimum requirements, the subject will be given a mark of FAIL and the numerical mark on the 0-10 scale for the element failed. If more than one element of assessment has been failed, the element with the highest mark on the 10-point scale will be used.



- If one or more of the minimum requirements is not met and one element of assessment has not been assessed, the subject will be given a mark of FAIL and the numerical mark on the 0-10 scale for the element failed.
- If two elements of assessment meet the minimum requirements and a third element has not been assessed, the subject will be given a mark of FAIL and the average numerical mark resulting from the two elements passed and the non-assessed element (which awards 0 points). The highest mark possible is 4.9.
- If the element of assessment with the highest weighting meets the minimum requirements but any of the remaining elements has not been assessed, the subject will be graded as FAIL. The elements will be added and: a) if the result is less than 5, the subject will be given that mark; b) if the result is more than 5, the subject will be given a mark of 4.9.

Review of and appeals against assessment results shall be subject to the Regulations for Appealing against Marks ( A C G U V 1 0 8 / 2 0 1 7 )

([http://www.uv.es/graus/normatives/2017\\_108\\_Reglament\\_avaluacio\\_qualificacio.pdf](http://www.uv.es/graus/normatives/2017_108_Reglament_avaluacio_qualificacio.pdf))

## REFERENCES

### Basic

- CARLSON, N.R. (2018). Fisiología de la conducta (12 ed.). Pearson Educación SA, Madrid.
- PINEL, J.P.J. & BARNES, S.J. (2018) Biopsychology (10 edic.). Pearson - Addison Wesley, Madrid.
- MESA-GRESA, P. et al. (2021) Explora tu cerebro: actividades prácticas de Fundamentos de Psicobiología (2 ed). Tirant lo Blanch
- MESA-GRESA, P. et al. (2021) Explora el teu cervell: activitats practiques de Fonaments de Psicobiologia (2 ed). Tirant lo Blanch
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### Additional

- DEL ABRIL, A., et al. (2001) Fundamentos biológicos de la conducta (2ª edic.). Sanz y Torres, Madrid
- PINEL, J.P.J. (2006) Biopsicología (6 edic.). Pearson - Addison Wesley, Madrid.
- REDOLAR, D. (2018). Psicobiología. Ed médica panamericana
- PURVES, D. (2016). Neurociencia. Ed médica panamericana
- CROSSMAN A.R. y NEARY, D. (2020) Neuroanatomía: texto y atlas en color. Elsevier
- FELTEN, D.L. et al. (2019). Netter. Cuaderno de neurociencia para colorear. Elsevier



## **ADDENDUM COVID-19**

**This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council**

### **1. CONTENTS**

Contents included initially in teaching programme are reduced to essential learning outcomes. Specifically, contents on block 2 and block 5 are reduced, as described below:

Unit 2. Genetics of behaviour. Chromosomal theory of heredity. Autosomal inheritance and sex-linked inheritance. Alterations in the sex chromosomes. Epigenetics.

Unit 3 and 4. They will be studied with readings and transversally in other units.

Unit 12. Relationship among systems: psycho-neuro-endocrine-immunology. Neuroinflammation. Microbiota-intestine-brain axis.

### **2. WORKLOAD AND TIME PLANNING**

The volume of work for the student is maintained, according to the teaching guide. The theoretical-practical classes will be developed according to a hybrid model of semi-attendance, so that the student will receive a face-to-face session for every two non-attendance, in alternate weeks. The face-to-face week will be subdivided into the group, with each subgroup attending a single session. The student will receive 33% of classroom classes and 66% of non-classroom classes (synchronous). The reduction in the total number of teaching hours entails more active work by the students, which will be duly supervised and reviewed by the teachers.

In the event of an unexpected situation that prevents the face-to-face sessions, students will receive 100% of the sessions in a non-face-to-face format. In this case, the entire group will participate in all sessions, which will be through videoconferences.

The subgroups will act as a unit, and no modifications can be made between them. The student who cannot attend due to a major cause (such as illness or isolation, always properly justified), will be able to recover the activities.

### **3. TEACHING METHODOLOGY**

Mixed teaching methodology systems will be used, including:

- presence and videoconference master classes,
- performing problems and case studies,
- laboratory practices and / or video viewing,





- synchronous and asynchronous videoconferences and recorded transparencies,
- debates in the forum.

Students will be encouraged to carry out work prior to sessions in order to actively take advantage of them. The sessions can also be used for continuous evaluation.

The tutorials will be: face-to-face (as long as there is no unexpected situation), by email in the virtual classroom and by videoconference

#### **4. EVALUATION**

To pass the course it is necessary to reach 50% of the maximum grade, obtained through a final exam and continuous assessment activities.

-Final exam: 50% of the final grade. There will be a performance test on the level of knowledge of the theoretical-practical contents, which may have objective questions, questions to fill in the gaps and open-ended questions. Said test will be eliminatory, having to obtain at least 50% of the grade (2.5 out of 5) to pass the course. The test will be done in person.

In case of unexpected difficulty and related to the health situation produced by the COVID-19 (as long as it is properly justified), the final exam may be conducted in person, through the virtual classroom, on the day and time set by the Faculty of Psychology. If the student has connection problems, the student must re-enter the virtual classroom (the exam where they stayed will automatically open) and continue taking the exam. In the case of unexpected difficulties and the impossibility of (re) connecting, it must be documented by means of a screenshot or photo), and contact your teacher using the UV corporate account (@ alumni.uv.es). The responsible teacher will get in touch to take the exam on an alternative day (oral or face-to-face, if the health authorities and the consequent contingency plans of the UV so allow).

-Continuous assessment activities: 50% of the final grade. The activities may include questionnaires, activities with anatomical models and / or with neuroanatomic applications, analysis of practical cases, individual or group work, book lectures, and must be delivered through the virtual classroom. In the event that any student has difficulties (duly justified), the teacher will specify an alternative method for carrying out and delivering the activities. The student who has not carried out (partially or totally) the activities without just cause (and informed throughout the course) and does not reach the pass (between exam and continuous evaluation), will take an exam of activities' content in the second call.

#### **5.- BIBLIOGRAPHY**

It remains unchanged from the teaching guide.