

Developmental Psychobiology

Brief description of course content (according to the programme's verification report)

Descriptors: Concepts and techniques in Developmental Psychobiology, molecular genetics, nervous system development, quantitative genetics, epigenetic factors, the brain and pre-natal, post-natal, adolescent behaviour and behaviour during ageing.

Learning outcomes

- To identify the specific nature of Developmental Psychobiology's approach and distinguish it from other related disciplines.
- To distinguish between different kinds of neural plasticity and understand their interaction throughout the life cycle.
- To identify the processes involved in the formation and development of the nervous system throughout life, as well as its relationship with behaviour development and modifications.
- To understand genetic expression mechanisms and their relationship to behavioural alterations, as well as the approaches and methods of genetics and epigenetics for explaining normal variability in human behaviour.
- To further knowledge on the cognitive, behavioural and/or emotional repercussions of developmental disorders.
- To use knowledge about nervous system development throughout life to facilitate the appropriate development of cognitive-emotional functions and the treatment of its pathologies and/or alterations.
- To convey clearly and concisely the knowledge about Developmental Psychobiology and its possible applications from the pre-natal stage to ageing.
- To develop critical positions and raise relevant issues in the area of development.

Planned learning activities

Theory Syllabus

- **Topic 1.- Brain plasticity and development.** Concepts, plasticity and development, critical and sensitive periods.
- **Topic 2. Epigenetic factors and developmental epigenetics.** Basic concepts and genetic mechanisms. Inheritance. Mutations. Epigenetic mechanisms and concepts.
- **Topic 3.- Origin and development of the nervous system.** Development of the nervous system, morphological and histological stages, main alterations.
- **Topic 4.- Pre- and post-natal development: Cognitive functions and prematurity.** Development of the main neurocognitive functions and their critical-sensitive periods.
- **Topic 5.- Main genetic neurodevelopmental syndromes:** Basic concepts about the neurodevelopmental alterations and classification. Main genetic syndromes: Down syndrome, fragile X syndrome, Williams syndrome, Angelman syndrome, Prader-Willi syndrome.

- **Topic 6. Neurodevelopmental disorders.** Definition of neurodevelopmental disorders. ADHD, ASD and other neurodevelopmental disorders.
- **Topic 7.- Psychobiology of adolescence and ageing.** Brain and behavioural changes associated with adolescence. Ageing: basic concepts, brain development and normal vs. pathological neurophysiological development.

Practical Syllabus

The practical exercises are aimed at improving and broadening understanding of the theoretical topics explained in class. For this, individual and group exercises in the form of seminars and workshops will be undertaken, where recent research relevant to the field will be analysed; related audiovisual material will be worked on and seminars and/or debates will be organised on the different aspects of early, adolescent and ageing neurodevelopment. As a cross-cutting theme to all the practical exercises, students must carry out a group research study on Developmental Psychobiology.

Contents structured in topics:

Topic 1: Characteristics of Developmental Psychobiology and its research: practical examples, review of publications and forming work groups.

Topic 1: Seminar on the main conceptual models about the interaction between development, genetics and the environment: critical analysis of scientific articles.

Topic 2: Homemade DNA extraction and review of the current genotyping, epigenetic and pre-natal screening techniques.

Topics 3-7: Watching videos and subsequent critical analysis.

Topics 3-7: Seminar about relevant scientific articles in the field.

Topics 2-7: Group work: to undertake research and present it to the class. Students will be trained through in-person sessions and group tutoring on how to do a literature search to create the theoretical framework, apply the chosen methodology, record information, analyse and subsequently present the research undertaken, in article format.