# GUIDE OF THE COURSE

## NEUROBEHAVIOURAL PLASTICITY

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<tr>
<th>MODULE</th>
<th>SUBJECT MATTER</th>
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<th>PERIOD</th>
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<tr>
<td>Cognitive and Behavioural Neuroscience</td>
<td>Neurobehavioural Plasticity</td>
<td>Neurobehavioural Plasticity</td>
<td>2017-18</td>
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### TEACHER(S)

- Milagros Gallo Torre (a)
- Isabel de Brugada Sauras (b)

### CONTACT ADDRESS:

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### STUDENT CONSULTATION:

(a) Office 330. First quarter: Th., Fr: 8:00-11:00; second quarter: W: 8-14.
(b) Office 211. First quarter: M, Tu: 8:00-11:00; second quarter: W: 11-15, F: 11-13.

### MASTER PROGRAMME:

Cognitive and Behavioural Neuroscience

### OTHER MASTER PROGRAMMES:

<table>
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<th>REQUIREMENTS/RECOMMENDATIONS</th>
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<tr>
<td>Basic knowledge (Graduate level) on Conditioning, Learning, Psychobiology</td>
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<td>Ability to read and understand scientific texts in English</td>
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<td>Basic IT knowledge</td>
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### BRIEF DESCRIPTION OF THE COURSE CONTENTS

2. Neurobiology of learning (2.1. Neural plasticity and learning 2.2. Neurobiology of extinction and context modulation 2.3. Cortical plasticity and perceptual learning)

### GENERAL AND SPECIFIC COMPETENCIES OF THE MODULE
General:
To gain knowledge on the psychological processes and their neural bases
To gain knowledge on the main methodology in cognitive, emotional, and behavioural neuroscience
To promote skills to apply knowledge on psychological processes and their neural bases to professional environments
(Neuropsychology, Neuroscience, Ergonomics, Education, etc)
To gain knowledge about the deficits in human cognitive processes and their neural substrates, assessment, and rehabilitation

Specific:
To gain advanced knowledge of the explicative processes relating to associative learning and the plastic properties of the nervous system which make the learning process possible, from the molecular level up to the system level.
To analyze the main concepts and notions relating to this field of study, thus enabling the student to understand current problems in the fields of associative learning and the neurobiology of learning.
To use and become familiar with the main basic methodology and design used in psychology and the psychobiology of learning

OBJECTIVES OF THE COURSE

The student will know:
The cellular and molecular mechanisms of neural plasticity involved in learning and memory
The principles of reorganization of the neural systems induced by the experience
The theoretical foundations and the current models of associative learning
Advanced knowledge on complex learning phenomena: conditional and perceptual learning
Behavioural techniques to distinguish goal-directed action and habits, and their neural substrates

The student will be able to:
Identify the underlying neural-plasticity mechanisms involved in different kinds of behavioural changes
Apply and deduce hypothesis from the theoretical models of associative learning
Analyze advanced experimental designs of complex learning phenomena and their neural mechanisms
Acquire precise academic standards thus enabling the student to develop and discuss in group scientific work on specific topics relating to the course contents.
Use basic IT and information tools for the purpose of research.

COURSE PROGRAMME

1. Introduction to associative learning
2. Introduction to neural plasticity
3. Extinction and context modulation
4. Neurobiology of the extinction and context modulation
5. Stimuli-exposure phenomena: Latent inhibition and perceptual learning
6. Cortical plasticity and perceptual learning

REFERENCE READINGS
Required readings:


Reference readings:

**Neural plasticity**


**Behavioural plasticity**:


**RECOMMENDED LINKS**

http://www.wellesley.edu/Biology/Concepts/Html/neurogenesis.html
http://www.ddnalc.org/ddnalc/cell_signals/index.html
http://www.genome.gov/27532724

**TEACHING METHODS**

Compulsory attendance of classes (25 hours, 1 credit)

Lectures
Critical analysis and discussion of articles in the classroom
Oral presentation of pieces of work
Supervised lab training
Final exam covering the entire course syllabus

Work project (75 hours, 3 credits)

Bibliographic search on specific topics
Critical reading of scientific papers  
Required work on specific topics  
Preparation of oral presentations of specific topics  
Web tutorials (email, moodle, etc)

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<th>CRITERIA AND METHODS OF ASSESSMENT</th>
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<tr>
<td>Active participation in class: 10%</td>
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<tr>
<td>Oral presentation of a specific topic: 30%</td>
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<td>Exam covering the entire course syllabus: 60%</td>
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