

## COURSE SYLLABUS

### Cognitive Neurosciences in The Clinical Practice

2526-2-F5108P013

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#### Learning area

Methods and techniques for treatment and rehabilitation

#### Learning objectives

##### *Knowledge and understanding*

- Adaptive and maladaptive plasticity
- Psychobiology of homeostasis.
- Elements of Psycho-neuro-endocrino-immunology
- Chronic disruptions of homeostasis and mind-body relationship (stress, trauma, chronic pain)

##### *Applying knowledge and understanding*

- Knowledge about the relationship between brain functions and body homeostasis, in the normal and pathological behavior
- Acquisition of knowledge useful in a heuristic and rehabilitative framework
- Ability to design diagnostic and rehabilitative projects using the knowledge acquired

##### *Making Judgements*

- Students will be guided into analysing relevant literature and prepare an essay and a presentation by choosing topics, methods and bibliography according to the importance of meeting scientific standards and critical thinking reinforced during the course.

##### *Communication skills*

The course provides a preparation related to the methods of research and presentation of research projects, which

students will be able to put into practice by preparing their presentations and illustrating them to the class.

### *Learning skills*

During classroom lessons, contributions from external experts and the preparation of personal papers, students will acquire working and research methods that can become operational models to contribute to their ability to learn information in their future.

## **Contents**

- Functional and dysfunctional brain plasticity. Brain representation of pain, biopsychosocial aspects of chronic pain
- Neurobiological mechanisms of homeostasis, stress and trauma
- Neuroscience of mind-body interaction: influence of mental states on the immunitary, cardio circulatory, gastrointestinal systems
- Neurobiological effects of complementary therapies

## **Detailed program**

- Degenerative brain processes, plastic and maladaptive brain plasticity
- Psycho-neuro-endocrino-immunology in the homeostasis
- Body and self-representation in the intact and dysfunctional brain
- Physiopathology of acute and chronic pain: biopsychosocial approaches in the treatment of chronic pain
- Neurobiology of placebo effect and its importance as a model of clinical interaction
- Disruption of mind-body balance (stress, psychological trauma, immunitary, cardiocirculatory and gastrointestinal functions); the psychoneuroendocrinological model
- Neuroscientific approach to integrated therapies in the domain of neuropsychology (mirror box), neurophysiology (brain stimulation, biofeedback, neurofeedback), and behavioral interventions (meditation, clinical hypnosis)

## **Prerequisites**

Basic knowledge about anatomy and physiology of the central nervous system

## **Teaching methods**

Traditional class lectures in Italian will be completed by seminars with a practical orientation, during which students and teacher will discuss about given issues related to the course, together with experts in the field.

Students will be also guided through the preparation of group projects on diagnostic and therapeutic procedures related to the topic of the course, which will be also presented to the whole class and critically discussed. This aspect of the course aims at stimulating critical soft skills necessary to the preparation and presentation of innovative diagnostic or interventional projects based on a solid scientific background.

## **Assessment methods**

Written examination with multiple-choice questions, aimed at assessing the acquisition of basic notions, and an essay, aimed at assessing the ability of exposing more complex topics in a synthetic but informative way.

The overall assessment will take into account the optional group projects prepared and presented by the students during the course.

Erasmus students can contact the teachers in order to obtain bibliography in English and/or organize exams in English language.

## **Textbooks and Reading Materials**

Detailed information about reading material will be given on course start, and published on the course webpage.

## **Sustainable Development Goals**

GOOD HEALTH AND WELL-BEING

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