UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

# Neuropsychological Rehabilitation

**2122-2-F5104P024**

## Learning area

Models and techniques for treatment and rehabilitation

## Learning objectives

*Knowledge and understanding*

- Neurobiological and functional basis of spontaneous and treatment-induced recovery of cognitive, emotional-motivational and behavioral deficits, caused by brain lesions and dysfunctions.
- Efficacy of neuropsychological treatments.

*Applying knowledge and understanding*

- Setting up, running, and evaluation of neuropsychological rehabilitation treatments.
- Ability to evaluate the relevant scientific literature, in order to plan and perform clinical and research activities in this area.

## Contents

The course provides information concerning the neurobiological and functional basis of recovery - both spontaneous, and brought about by rehabilitation treatments - of cognitive and behavioral deficits, caused by brain lesions and dysfunctions. The course provides information aimed at the acquisition of knowledge and skills

concerning the setting up, and running of neuropsychological rehabilitation treatments, and the ability to evaluate the relevant scientific literature.

## Detailed program

*Introduction*

- Historical background, methodological foundations.
- Spontaneous functional recovery and neuroplasticity.
- Effectiveness of rehabilitation, as related to the neurological etiology of the deficit, and its spontaneous course.

*Main rehabilitation methods*

- Behavioral methods, based on the explicit training of the defective cognitive and emotional-motivational function(s), and the abnormal behaviors.
- Training to the vicarious use of not/less impaired cognitive functions and skills.
- Sensory stimulations.
- Transcranial stimulations (electrical and magnetic).

- *Rehabilitation of different neuropsychological functions*
- Aphasia: disorders of oral and written language (dyslexias and dysgraphias).
- Acalculia.
- Apraxia: disorders of complex intentional movement.
- Syndrome of unilateral spatial neglect and other deficits of spatial cognition.
- Amnesia and deficits of short-term memory.
- “Dysexecutive” or “frontal” syndrome and disorders of non-spatial attention.
- Agnosia: disorders of object identification in the visual and acoustic modalities.

*Neuropsychological treatment and support in specific diseases*

- Dementias (in particular, Alzheimer Disease and Primary Progressive Aphasias).
- Head-injury and chronic deficits of consciousness (vegetative state, post-hypoxic/anoxic syndrome).

*Evaluation of the efficacy of a neuropsychological treatment.*

## Prerequisites

Knowledge is required concerning:

1) Genetics and Biology, as taught in the relevant courses (basic knowledge);

2) the anatomy and the physiology of the central nervous system, as taught in the course of “Anatomo-physiological Foundations of psychic Activity“;

3) the neurofunctional organization of cognitive and emotional-motivational processes, as taught in the course of “Physiological psychology” (BA degree in Psychological Sciences and Techniques). Finally, knowledge is required concerning the main neuropsychological syndromes and the clinical diagnosis in neuropsychology, as taught in the

course of “Neuropsychology of the adult and the elderly”.

## Teaching methods

Theoretical classes; illustration and discussion of diagnostic and rehabilitation materials and tasks for the assessment of neuropsychological recovery.

*Lessons will be held in presence, unless further COVID-19 related restrictions are imposed.*

*Although this course is held in Italian, for Erasmus students, course material can also be available in English, and students can take the exam in English if they wish to do so.*

## Assessment methods

1. Written assessment. The written assessment includes multiple choice and open-choice questions on the topics of the course. An example of the organization of the written assessment is the following:

a) 32 multiple choice 4-alternative questions, with 1 correct choice. One point is assigned for each correct answer, with no penalty. The minimum score for a successful assessment is 18 out of 32 correct answers. Example: “In the rehabilitation of unilateral spatial neglect by visual prisms, the effective direction of the prism-induced shift is: 1: leftward; 2: rightward (correct choice); 3: alternate; 4: downward.

b) An open question on a clinical case to which a complete and concise response is to be provided. A maximum of 16 points is assigned to the response to the open question, based on the assessment by the teacher. Example: “A 74-year-old woman is hospitalized following left cerebral stroke. The neuropsychological assessment reveals the presence of conduction aphasia and phonemic buffer deficit. Critically describe the objectives of the rehabilitation program and the main rehabilitation techniques”. The final score will be the weighted average of the written exam (2/3 for closed questions and 1/3 for the open question).

2. Oral assessment (optional, after the written assessment). The oral assessment includes one or more open questions, to which concise and complete responses are to be provided. Example: “What are the techniques based on the alternative and augmentative strategies for the rehabilitation of aphasia?”. In the case of an oral exam, the score will be 16th and it will be considered ¼ of the final score.

The students’ learning may be also evaluated by a written (see above #1) in itinere assessments, performed at the end of the course.

IMPORTANT. If the exam were to be performed remotely, the oral assessment will be requested.

*During the Covid-19 emergency, exams will be conducted according to the University’s regulations regarding the COVID-19 emergency situation.*

## Textbooks and Reading Materials

- Vallar, G., & Papagno, C., a cura di (2022). Manuale di riabilitazione neuropsicologica. Bologna: Il Mulino.
- Mazzucchi A., a cura di (2020). La riabilitazione neuropsicologica. Premesse teoriche e applicazioni cliniche". Quarta ed. Edra. (Cap. 1, 2, 5, 6, 18).
- Learning materials made available on the web site of the course.