Fiche UE M2 5BN
New Methods for Behavioral & Cognitive Explorations: Applications to Neurodegenerative Diseases (NDD)

Lead	Karim NDIAYE
Co-lead	Hélène CHEVAL

Description	*Parcours type*	*Option*	*Level*	*Semestre*	*ECTS*	*Effectif maximal*
	Neurosciences		M2	S3	3	12

Course structure	*Hours Lectures*	*Hours TD*	*Hours Practicals*	*In class/Distance*
	18 h	10 h	7 h	In class (partly feasible online)

Goals / Concept	Neurodegenerative diseases (NDD) have often been initially described as behavioral and cognitive disorders. Yet progress in the description of their pathological mechanisms has been mainly driven by the advances of biological methods. In recent years, new methods from cognitive, behavioral and engineering sciences have allowed us to also refine our understanding of the behavioral and cognitive aspects of NDD. This course thus aims at introducing various examples of novel methodologies for quantitatively assessing the behaving patients. It will mostly focus on NDD-related issues through practical demonstrations and lectures, but it will also be of high relevance for other brain and mental disorders.

Themes / Déroulé	This one-week course is structured around practical demonstrations of the most up-to-date research tools, which are available at the Institut du Cerveau, for exploring the behavior and the cognition (emotion and thought processes) in patients, mostly at the PRISME core facility. It will include lectures by expert researchers and practicals for students to experiment on themselves and/or on their peers the implementation and operation of a variety of assessment tools such as: computerized cognitive tests, eye-tracking systems, movement trackers, digital devices… Connections with functional brain imaging will also be illustrated through a tour of the ICM brain imaging facility (CENIR) and real-life market-ready applications will be demonstrated in partnership with the ICM startup program. Lectures provided by expert researchers will directly illustrate through concrete research programs how such tools have been used to investigate motivational disorders in Parkinson's Disease, apathy in Fronto-Temporal Dementia, spatial memory deficits in Alzheimer's Disease, etc. The module will be validated with an oral presentation (40%) and a written exam (60%). The oral presentation will be prepared in pairs through the week from a critical analysis of a recently published research paper, and delivered to the whole class on the last day of the week.

Competencies acquired upon completion of the course (concepts, methodology and tools)	- Introduction to cognitive and behavioral research - Basic knowledge of the cognitive and behavioral symptoms of NDD - Interests and limits of current methodologies used in experimental psychology - Evaluate the validity and relevance of these approaches and tools in NDD - Understanding the current hypotheses on the connections between psychological disorders and neurobiological mechanisms in NDD

Prerequisite	This module is aimed at students from biological backgrounds with no specific prerequisite.

Evaluation/100	*Written*	*Oral*	*CC*	*Other*
	60	40	no	no

Languages used	*In class*	*In documents, educational supports*
	English	English

Location	Institut du Cerveau (ICM), Pitie-Salpetriere Hospital