Course unit English denomination	Learning, memory and actions: from neural circuits to complex behaviours
SS	BIOS-09 Fisiologia
Teacher in charge (if defined)	Manuela Allegra Letizia Mariotti
Teaching Hours	10
Number of ECTS credits allocated	2
Course period	To be defined
Course delivery method	☒ In presence ☐ Remotely ☐ Blended
Language of instruction	English
Mandatory attendance	☒ Yes (80% minimum of presence) ☐ No
Course unit contents	• Role of hippocampus in learning and memory (spatial memory and navigation) • Role of superior colliculus in actions (goal-oriented actions and adaptive behaviours) • Learning, memory and actions impairment in neurodegeneration: focus on stroke and Alzheimer's disease • Fundamentals of in vivo electrophysiology and its application in freely moving animals. • Fundamentals of in vivo imaging in freely moving animals. • Fundamentals of in vivo optogenetics in freely moving animals.
Learning goals	By the end of the course, PhD students will have acquired: • The fundamentals of functional and structural neurobiology of learning and memory, with a particular focus on spatial navigation and goal-oriented actions. • Essential knowledge of the neurobiology of neurodegeneration (e.g., stroke, Alzheimer's disease). • The skills to apply major techniques for studying learning and memory in murine models, including in vivo electrophysiology, imaging, and optogenetics.
Teaching methods	• Facilitate plenary discussions • Teach using interactive methods • Foster critical reflection in the classroom • Utilize the critical incident technique

	• Encourage effective feedback • Establish authentic relationships in the classroom
Course on transversal, interdisciplinary, transdisciplinary skills	☐ Yes ☒ No
Available for PhD students from other courses	☒ Yes Classes are open to doctoral students only in the following courses: Biosciences ☐ No
Prerequisites (not mandatory)	Basic knowledge of cell biology
Examination methods (if applicable)	True/false or multiple-choice
Suggested readings	• Course's slides • Scientific articles related to the topics covered, available on PubMed • Reference text: Principles of Neuroscience, E. Kandel
Additional information	N/A