


3.00 credits	30.0 h	Q1
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Teacher(s)	Gailly Philippe ;Kienlen-Campard Pascal ;Missal Marcus (coordinator) ;
Language :	French
Place of the course	Bruxelles Woluwe
Prerequisites	The prerequisite(s) for this Teaching Unit (TU) are specified at the end of this sheet, in relation to the programmes/ training courses that offer this TU. <i>The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.</i>
Main themes	<ul style="list-style-type: none"> - What is a system? What does systems neuroscience bring that other approaches, cellular and molecular, do not? Biomedical interest. - Introduction to the main investigative methods and techniques in Systems Neuroscience: electrophysiology (extracellular), irreversible and reversible lesions, magnetic stimulation, structural and functional imaging. - Animal models and transgenesis. - Sense organs and transduction mechanisms. - Central mechanisms of sensory information processing: vision (+ eye movements), somesthesia, pain, proprioception, balance, hearing. - Motor control: tone, posture, spinal reflexes, pyramidal system, central grey nuclei (Parkinson's, Huntington's), cerebellum, automatic and voluntary movements. - Different forms of learning and memory.
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <p>At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> 1. Describe the different forms of memory. 2. Describe the structures involved in encoding and storing memory. 3. Explain the cellular and molecular pre- and post-synaptic mechanisms of different forms of synaptic plasticity. 4. Define and explain different notions related to pain. 5. Explain pathways and mechanisms of activation and modulation of pain pathways. 6. Describe the consequences and mechanisms of alterations in pain pathways, and their measurements in humans and animals. 7. Describe the different treatments for pain and their mechanisms of action. 8. Define the concept of rhythm at the level of the neuron and the nervous system. 9. Explain the molecular mechanisms and neural pathways that control the circadian clock. 10. Describe the structures involved in waking-sleep patterns and explain the mechanisms associated with sleep disorders.
Evaluation methods	Written exam, essay questions and short answer questions. Multiple choice questions. Weighting per teacher: 50% of the final mark awarded for Marcus Missal's part, 30% for Pascal Kienlen-Campard's part and 20% for Philippe Gailly's part.
Content	The lecture is subdivided into 3 main parts. In the first part, general questions about the systems approach in neuroscience, as well as specific methods, animal models and transgenesis will be discussed; in the second part, sensory and motor systems will be studied; in the third part, different forms of memory and learning will be presented.
Other infos	Prerequisites: General biology, cytology and histology courses (Bac 1&2) are prerequisites as well as WSBIM1220 or equivalent.
Faculty or entity in charge	SBIM

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Additionnal module in Biomedical Sciences	APPSBIM	3		
Bachelor in Biomedicine	SBIM1BA	3	WMD1120 AND WMD1006 AND WSBIM1201T AND WSBIM1201P AND WSBIM1220	