

CATALOG INFORMATION FOR MUST COURSES AND NSNT COURSES

NSNT 501 - INTRODUCTION TO COMPUTATIONAL NEUROSCIENCE (3-0)3 / 8 ECTS

This course offers a broad introduction to computational principles and models of neural systems and it explores how the brain works, from a computational perspective. Topics includes modeling the behavior and dynamics of single neurons and small systems of neurons; computational models for several major brain areas such as the visual cortex, basal ganglia, hippocampus, in relation to computational methods including independent component analysis, sparse coding, reinforcement learning, associative memories; general theories of inference in the brain such as the models based on belief propagation, deep belief nets, hierarchical graphical models; The course include small programming assignments in MATLAB.

NSNT 502 - VISUAL PERCEPTION (3-0)3 / 8 ECTS

This course offers an introduction to physiological and psychological aspects of visual perception with a focus on processing of colour, object recognition, motion and depth. Moreover, the course covers many computational paradigms and approaches that attempt to model these aspects directly or to use inspirations from them in building artificial vision systems.

BIOL 716 - CELLULAR AND MOLECULAR NEUROBIOLOGY (3-0)3 / 8 ECTS

The course provides an evaluation of the morphological and functional properties of neurons and glial cells emphasizing the differences with other tissues. Briefly discusses different patterns of neuronal activity. It gives insights into molecular structure and functioning of electrical and chemical synapses. Covers analysis of cytoskeletal elements underlying axonal transport. Discusses isolation, mapping, and functional analysis of transmitter substances, membranous receptors, and ion channels. The course also provides an overview of signal transduction pathways, molecular mechanisms of neuronal plasticity (e.g. in learning and memory), and the genetic and epigenetic factors crucial for neurogenesis.

NSC 701 - BASIC NEUROSCIENCE (3-0)3 / 12 ECTS

This course introduces the cytology, molecular biology and electrophysiology of neurons, neuromediators and interneuronal interactions. The functional anatomy and physiology of the central and the peripheral nervous systems are covered at the systems level.

NSC 731 - NEUROPHYSIOPATHOLOGY (3-0)3 / 6 ECTS

This course covers the primary mechanisms of neurological and psychological disorders of nervous system. Topics include, myastania gravis, epilepsy, cerebral ischemia, basal ganglion disorders, Alzheimer disease, demyelinisation, exitotoxicity and depression.

NSC 743 - NEUROPHARMACOLOGY (3-0)3 / 12 ECTS

This course examines the neuromediators, their receptors. postreceptor signalling mechanisms, their genetic regulation and the drugs acting on these pathways.