**CCNM-17-107:4: Psychophysiology of cognitive processes**
**Course Description**

## Aim of the course

**Aim of the course:** The goal of the course is to provide basic knowledge on the (primarily physiological) mechanisms underlying cognitive psychological processes such as learning, memory, attention, sleep, motivation and psychopharmacology. Both elementary aspects and integrative views are covered including the most important methodological (electrophysiology, biochemistry, neuroimaging, etc.) issues. The rationale behind this approach is that the horizon of the interpretation of the findings of basic and applied psychology becomes much wider and their link to principles of natural sciences easier to understand.

**Learning outcome, competences**

knowledge:

- get real research experience
- knows and understands the physiological and psychophysiological mechanisms underlying cognitive processes.

attitude:

- acquisition of the approach of an active researcher
- intent on deepening and strengthening their special professional interest.

skills:

- comprehensive methodological knowledge
- Understand how fMRI data is processed

## Content of the course

**Topics of the course**

- Introduction and brief history of cognitive neuroscience
    - Most important and relevant findings obtained by advanced methods in neuroscience i.e. by
    - electroencephalography
    - event-related potentials
    - neuroimaging (fMRI, PET, SPECT, FA, DTI)
    - electromyography and electrooculography
    - NIRS, EDA, TERP
    - ECG, TCD
    - lesion methods (TMS, TDC)
- Contribution of neuropsychopharmacology to cognitive neuroscience
    - The cognitive neuroscience of sleep and consciousness
    - Motor activity and cognitive performance
    - Learning and memory
    - Emotions and cognitive processes
    - The role of stress in cognitive processes
    - Aging and cognitive performance

**Learning activities, learning methods**

Lectures and interactive discussions

## Evaluation of outcomes

**Learning requirements, mode of evaluation, criteria of evaluation:**
requirements

- attendance
- essays

mode of evaluation:

- examination, 1-5 grades

criteria of evaluation:

- quality and quantity of knowledge encomppasing the course
- quality of pracitcal exercises, homework, essays

**Reading list**

**Compulsory reading list**


- Carson, N. R. (1999). Foundations of Physiological Psychology. Needham Heights, MA: Allyn and Bacon.
- Cacioppo, J. T. (2007). Handbook of Psychophysiology. New York: Cambridge Univ Press.
- Baars, B. J., & Gage, N. M. (2010). Cognition, Brain, and Consciousness: Introduction to Cognitive Neuroscience. London: Academic Press.
- Kenneth Hughdal: Psychophysiology, Harvard Univ. Press, 2001.
- Jerry W. Rudy: The Neurobiology of Learning and Memory, Sinauer Associates, Inc. Publishers, 2008.
- P. Wright. Core Psychopharmacology. Saunders Elsevier, 2006 ISBN-10
- R.S. Feldman, J.S. Meyer, L.F. Quenzer:
- Principles of Neuropsychophyarnacology. Sinauer Associates, Inc. Publishers, 1997.
- L.R. Squire (et al.) Fundamental Neuroscience Academic Press, 3rd Ed. 2008.
- R. Cabeza et al) Cognitive Neuroscience of Aging Oxford Univ. Press, 2017


**Recommended reading list**

- If any, it shall be specified in the course description for each semester.