

Sleep and dream research

Aim of the course

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The aim of the course is to present the most prominent empirical findings of dream research, as well as to highlight the clinical and applied aspects of the science of sleep. Students will be instructed to work actively in the exploration of different topics, such as the role of sleep in memory consolidation, the ability to learn during sleep, the topic of sleep-specific neural oscillations, or the mechanism of sleep-dependent emotional regulation. The interdisciplinary course integrating the approaches of cognitive neuroscience, experimental sleep research and clinical neuroscience intends to raise the most important and to some extent unresolved questions of this intriguing altered state that we call sleep. At the end of the course the students will be familiarized with the main methods of quantitative EEG analyses.

Learning outcome, competences:

- **knowledge:** Knowledge of the main theories, findings and methods of sleep research.
- **attitude:** Open but critical, scientific attitude.
- **skills:** theoretical knowledge, ability to formulate scientific hypotheses.

Content of the course

Topics of the course

- Circadian rhythms, sleep regulation, chronotype and cognitive performance
- Sleep physiology 1. (Sleep stages, K-complexes, sleep spindles, local sleep)
- Sleep physiology 2. REM and microstates. The neuroscience of REM sleep.
- Sleep and learning (memory consolidation, information processing during sleep)
- Sleep and emotional memory (sleep and emotional regulation, PTSD, sleep and emotional reactivation)
- Sleep and development (sleep and language acquisition, sleep and aging, neurodegeneration)
- Sleep disorders and clinical aspects
- Circadian rhythm disorders, chronotherapy, seasonal depression.
- The evolution of sleep.
- Dream recall, dream amnesia, lucid dreaming, nightmares.
- Boundaries of the mind: mindwandering, meditation, altered states of consciousness.

Learning activities, learning methods

Reading and understanding articles, presentation, open discussion.

Evaluation of outcomes

Learning requirements, mode of evaluation, criteria of evaluation:

requirements

active participation in class

· knowledge of theoretical and practical knowledge discussed in class

· Oral exam

Reading list

Compulsory reading list

Recommended reading list

- The Neuroscience of Sleep (eds. Robert Stickgold and Matt Walker)
- Péter Halász & Róbert Bódizs: Dynamic Structure of NREM sleep