

Course Description

Biological foundations of psychology

Aim of the course

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The course focuses on those fields of biological sciences which are necessary to understand and apply contemporary theories of developmental psychological research. The course has two parts. The first introduces students to theories and researches in the field of behavioural genetics, the second part aims to provide information on the most important theories and methodological possibilities of neurology and cognitive neuroscience.

Learning outcome, competences

knowledge:

- general knowledge about the theories and methods of neurology and behavioural genetics
- understanding the genetic and neurological basis of behaviour and cognition, and the connections between them

attitude:

- understanding the complex connections between biological and psychological processes, avoiding oversimplification

skills:

- basic proficiency in interpreting and comparing theoretical frameworks and research results in the field of genetics and neurology

Content of the course

Topics of the course

- Behavioural genetics
 - Concepts and principles of quantitative genetics
 - Methods in heritability research (animal models and human studies)
 - Heritability in twin and adoption studies
 - Interactions of environmental and genetic factors
 - Constraints of quantitative genetics
 - Molecular genetics of behaviour. Heritability on a molecular level. Function and structure of DNA. Replicating DNA. Genetic code.
 - Human genome: structure and variability. Gene polymorphisms. Molecular genetics of human evolution.
 - Identifying genes. Genome analysis.
 - Factors regulating the gene expression. Epigenetic effects.
 - Molecular genetic background of psychological factors (temperament, intelligence, personality, psychopathology)
- Cognitive Neuroscience
 - Concepts and principles of cognitive neuroscience
 - Development of biological systems
 - Biological background of cognitive functions (sensory processes, attention, memory, language, executive functions, action planning, social interaction)
 - Age related changes in brain processes
 - Plasticity and development
 - Atypical neural development

Learning activities, learning methods

- lecture

- group activity in class
- individual literature preparation
- read and present literature
- project work
- presentation of the project work

Evaluation of outcomes

Learning requirements, mode of evaluation, criteria of evaluation:

requirements

- Robust knowledge of the theories and methods presented in the course literature and lectures
- Mode of evaluation: a five-point grading scale based on the different course activities

Mode of evaluation:

- written exam (genetics)
- oral exam and presentation (cognitive neuroscience)

Criteria of evaluation:

- professional knowledge in the written test/exam
- quality of the presentations

• Reading list

Required readings:

- Plomin R, DeFries JC, Knopik VS, Neiderhiser JM. (2013). Behavioral Genetics. Worth Publishers, New York.
- Rutter M. (2006) Genes and behavior: Nature-nurture interplay explained. Blackwell. ISBN-13: 978-1-4051-1061-7 (paperback).
- McEwen BS et al. (eds) (2011). Social Neuroscience: Gene, Environment, Brain, Body. Annals of the New York Academy of Sciences, Vol. 1231. ISBN-13: 978-1-57331-840-2
- <http://www.nature.com/scitable/ebooks/cntNm-3>
- <http://www.nature.com/scitable/topic/genetics-5>
- <http://www.nature.com/scitable/ebooks/cntNm-8>
- <http://www.nature.com/scitable/ebooks/cntNm-16553838>
- Charles A. Nelson, Monica Luciana (Eds): Handbook of Developmental Cognitive Neuroscience. 2nd edition. 2008. MIT Press.
- Bryan Kolb, Ian Q. Whishlaw: Fundamentals of Human Neuropsychology. 7th edition. Worth Publishers, 2015. (Fejezetek.)