UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Developmental Cognitive Neuroscience

2526-1-F5110P003

Learning area

KNOWLEDGE AND SKILLS USEFUL TO UNDERSTAND, PROMOTE AND CHANGE INDIVIDUAL PSYCHOLOGICAL FUNCTIONING

Learning objectives

Making judgments
Upon successful completion of the course, students will have acquired:
• The ability to understand and critically read scientific literature in the field of developmental psychology and cognitive neuroscience.
• The ability to critically interpret scientific research data.
• The ability to identify the implications of neuroscientific evidence for explaining the development of the human mind.

Communication skills
This course fosters the development of communication skills through in-class discussions of research and empirical evidence. Students also have the opportunity to present a research project on topics related to course content. The bibliography includes English texts, and the exam features open-ended questions that require appropriate language use, the ability to construct arguments, and to connect acquired knowledge. These abilities are also assessed during the oral examination, if required.

Learning skills
Upon successful completion of the course, students will have acquired:
• The ability to engage with scientific literature and learn from it by selecting, combining, and evaluating the reliability of diverse sources.
• The ability to critically engage with and integrate interdisciplinary knowledge.

• The ability to apply knowledge of the principles guiding neurocognitive development to understand the link between early environment and psychological well-being.
• The ability to apply knowledge of the principles guiding neurocognitive development to enhance learning processes.
• The ability to apply knowledge of the principles guiding neurocognitive development to understand neurodevelopmental syndromes.

Knowledge and understanding
Upon successful completion of the course, students will have acquired:
• Knowledge and understanding of the relevance of developmental processes in human formation, with a focus on support and prevention.
• Knowledge and understanding of the importance of mind-brain interactions in development.
• Knowledge and understanding of the systemic and probabilistic nature of development.
• Understanding of the implications of neuroscientific evidence for comprehending development.
• Knowledge and understanding of the importance of early experiences in the neurocognitive and socio-affective development of the individual.
• Knowledge and understanding of the relevance of mind-body interactions in development.

Applying knowledge and understanding
• Developing the ability to understand and communicate scientific evidence on infant cognition
• Developing critical thinking skills that enable to identify theoretical implications of neuroscientific evidence for the explanation of developmental change
• Applying knowledge of the principles guiding neurocognitive development to understanding the link between early environment and emotional well-being
• Identifying early markers of typical and atypical development
• Understanding of key factors in promoting neurocognitive development
• Applying knowledge of principles guiding neurocognitive development to the enhancement of learning processes
• Applying knowledge of principles guiding neurocognitive development to understanding neurodevelopmental syndromes

Contents

Beginning with the theoretical framework offered by the neuroconstructivist approach, the course aims to illustrate the contribution that methods and knowledge of functional brain development have or could make to understanding the development of human cognition. We will consider the implications of evidence from developmental cognitive neuroscience for broader themes such as the role of experience and biological predispositions, critical and sensitive periods, and the modularity of the human mind. Subject areas will include attention, memory, face perception and social cognition. We will also consider the relationship between motor skills, perceptual experience and learning in childhood. The implications of the neuroconstructivist view of development will be discussed in relation with the trajectories of atypical development in neurodevelopmental syndromes, the impact of early adverse experiences on neurocognitive development and emotional well-being, and the promotion of learning processes.

Detailed program

• The neuroconstructivist approach to psychological development
• Development as a situated, distributed, and probabilistic process
• Methods and populations of developmental cognitive neuroscience
• Models of functional brain development and the Interactive Specialization Model

• The development of attention
• The development of memory
• Implicit learning as the foundation of development
• Social brain development: face recognition, understanding others' behavior, and mentalization
• Early indicators of atypical development
• The impact of environmental deprivation and adverse experiences on neurodevelopment
• Understanding and promotion of learning processes

Prerequisites

Basic knowledge about the classical theoretical models of developmental psychology, with particular reference to Piaget's theory and Cognitivism. Students who lack this knowledge should reach out to the lecturer in order to agree on an ad-hoc bibliography

Teaching methods

In addition to frontal lectures (80% of the teaching hours), the course offers guided discussions of video presentations and scientific articles, and group work. The course is in Italian.
Slides and scientific papers are made available to all students on the course e-learning site.

Assessment methods

The exam is written with oral interview upon request. The written exam includes multiple choice questions and open questions. Multiple choice questions provide extensive evaluation of knowledge acquisition; open questions evaluate students' critical thinking on such knowledge.

Evaluation criteria are as follows:

- Multiple-choice questions: Accuracy of answers.
- Open-ended questions: Appropriateness of terminology, logical and formal organization of the text, ability to support claims, and capacity to identify connections between concepts.

Students may ask to attend an oral interview, in addition to the written exam, on all the topics included in the Syllabus.

Textbooks and Reading Materials

1. Lecture slides

Further detailed information about the teaching materials will be posted on the course web page before classes start.

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING