

An introduction to developmental cognitive neuroscience

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1 ECTS

Summary

Objective: The objective of this course is to provide students with a general overview of how the brain develops from infancy through adolescence and how these developmental processes underlie cognitive and socio-emotional functions. The course will explore key theories, methodologies, and research findings, emphasising the relationship between brain development and cognitive/socio-emotional outcomes, the role of biological and environmental factors, as well as the implications for clinical and educational practice.

Course content: This course will cover the foundational concepts and methodologies in developmental cognitive neuroscience. It will examine typical brain development and its links to cognitive and socio-emotional outcomes, as well as atypical brain development in cases such as neurodevelopmental disorders, preterm birth, and congenital brain malformations. The course will introduce brain plasticity during development and delve into practical applications in clinical and educational settings, including intervention studies. In the context of this course, neuroscientific methods surveyed will mainly include MRI technics. Students will engage with current research on the topic through the presentation and discussion of an article.

Bibliography

- Munakata, Y., Casey, B. J., & Diamond, A. (2004). Developmental cognitive neuroscience: progress and potential. *Trends in cognitive sciences*, 8(3), 122-128.
- Siffredi, V., Preti, M. G., Kebets, V., Obertino, S., Leventer, R. J., McIlroy, A., ... & Van De Ville, D. (2021). Structural neuroplastic responses preserve functional connectivity and neurobehavioural outcomes in children born without corpus callosum. *Cerebral Cortex*, 31(2), 1227-1239.
- Pereira Camejo, M., Escobar Saade, L., Liverani, M. C., Fisch-Gomez, E., Gui, L., Borradori Tolsa, C., ... & Siffredi, V. (2024). Amygdala volumes and associations with socio-emotional competencies in preterm youth: cross-sectional and longitudinal data. *Pediatric Research*, 1-10.

Course level Introductory

Pre-requirements No prerequisites

Content of course sessions

- Basic concept introduction & methodologies in developmental cognitive neuroscience
- Typical brain development and its association with cognitive & socio-emotional development

- Atypical brain development and its association with cognitive & socio-emotional (e.g., neurodevelopmental disorders, preterm birth, congenital brain malformation)
- Role of biological and environmental factors
- Brain plasticity during development
- Educational and clinical applications (e.g., clinical intervention, school intervention)
- Article presentations from the students and discussion

Course materials This course will combine slides and ex-cathedra material with handouts (case studies), videos (short clinical videos) and interactive tools

Location [Cubotron building \(III\), UNIL-Sorge.](#)

Course dates **Thursday November 21 and December 5 from 1-5pm.**

Evaluation Personal preparatory work for a personal presentation on a research article (presentation and discussion – 20 min)
Evaluation of participation by the teacher: Yes
Final test: No

Registration The course is limited to 12 participants.
Register before November 1, 2024 by writing a mail to Indscourses@gmail.com (with your supervisor in copy) and stating the course title as subject.