

**Classes:** Mondays 1-3:40pm  
**Instructor:** Ralph-Axel Müller  
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**Office hours:** Mondays after class and by appointment  
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**Prerequisites:** Psy 260 (Proof of completion required: copy of transcript)

**Textbook & Readings:** Reading load will be about 20-30 pages per week (exclusive optional readings and additional readings for presentations and paper). Most readings from: CA Nelson & M Luciana (eds.) *Handbook of Developmental Cognitive Neuroscience*. - MIT Press 2001 [- \$98 at SDSU bookstore]. Purchase is recommended, but readings can also be duplicated from master copies.

**Description:** This course reviews the development of sensorimotor systems and cognitive domains and relates these to principles of brain development. Brain-behavior relationships in developmental disorders will also be examined and specific issues in pediatric applications of cognitive and neuroscientific techniques will be addressed.

**Goals:** Understanding of the brain bases of developing sensorimotor and cognitive systems in children, including pathological alterations in developmental disorders

**Grading:** 2 oral presentations in class = 40% (20% each): Mainly based on textbook chapters (plus limited amount of additional material); presentation length ~45min  
 Written paper = 35%: On a topic of choice related to developmental cognitive neuroscience, including independent literature search: length should be 15-20 pages  
 Participation in class throughout the semester: 25%

**Plagiarism:** Plagiarism (e.g., copying written material from others, from published material, or from internet sites) is not tolerated by the University and may lead to expulsion.

**Changes:** Any possible changes in topics, readings, or grading criteria will be announced and discussed in class.

Date	Topic	Readings	Optional readings
9-Sep	1 Overview		CA Nelson & FE Bloom <i>Child Devel</i> 68 (1997):970-87
	<b>A Principles of neurocognitive development</b>		
16-Sep	2 Brain development and evolution	MF Casanova et al in M Ernst & J Rumsey (2000) <i>Foundation and Future of Functional Neuroimaging in Child Psychiatry:113-36</i>	
	3 Prenatal formation of the nervous system	MS Gazzaniga et al. <i>Cognitive Neuroscience</i> (2002): p628-44	
23-Sep	4 Postnatal neurocognitive development	MS Albert et al in Zigmond et al <i>Fundamental Neuroscience</i> (1999):1313-28	
	5 Aging and degeneration	Albert et al.: 1328-35	
30-Sep	6 Synaptogenesis and selective stabilization	NL ch2	E Kandel et al. <i>Principles of Neural Science</i> (2000):ch.56
	7 Regional specialization	SL Pallas <i>Trends in Neuroscience</i> 24 (2001):417-23 {=pdf}	
	<b>B Techniques for the study of brain development</b>		
7-Oct	8 Guest Lecture Dr. Rita Ceponiene: [ERP and MEG in developmental studies]	NL ch9	
	9 Neuroimaging (structural; SPECT, PET)	MJ Rivkin <i>Ment Retard Dev Disabil Res Rev</i> 6 (2000):68-80 {=pdf}	
14-Oct	10 Functional MRI: Basics	PM Matthews in P Jezzard et al <i>Functional MRI</i> (2001): ch1	
	11 Functional MRI: Pediatric applications	NL ch10	GF Eden & TA Zeffiro in M Ernst & JM Rumsey <i>Functional Neuroimaging in Child Psychiatry</i> (2000): ch3

21-Oct	12	Behavior genetics	NL ch11	
<b>C Sensorimotor development</b>				
	14	Auditory development	NL ch15	
28-Oct	15	Visual development	NL ch16	
		Motor development	NL ch 18	
<b>D Cognitive development</b>				
4-Nov	17	Language	NL ch19	NL ch20
	18	Memory	NL ch25	
8-Nov	<i>Paper topics must be selected</i>			
11-Nov	19	Guest Lecture Prof. Joan Stiles: [Visuospatial cognition]	NL ch27 <sup>o</sup>	
	20	Attention	NL ch24	NL ch22
15-Nov	<i>Paper outlines due</i>			
<b>E Developmental Plasticity</b>				
18-Nov	21	Animal models	NL ch13	
	22	Imaging studies in children with early brain damage <sup>o</sup>	RA Müller & E Courchesne in Rumsey & Ernst (2000): p335-42	L Hertz-Pannier et al. <i>Brain</i> 125 (2002): 361-72
25-Nov	23	Experiential effects in humans	NL ch14	
<b>F Neurodevelopmental disorders</b>				
	24	Guest Lecture Dr. Natacha Akshoomoff: [Autism]	N Akshoomoff et al <i>Development and Psychopathology</i> 14 (2002):613-34 {=pdf} <sup>o</sup>	NL ch34
29-Nov	<i>Paper drafts due</i>			
2-Dec	25	Effects of early deprivation	NL ch39	
	26	Disorders of attention	NL ch36	JB Schweitzer et al. in M Ernst & JM Rumsey Functional Neuroimaging in Child Psychiatry (2000): ch16
9-Dec	27	Guest lecture Dr. Beverly Wulfeck: Specific language impairments	Leonard ch. 1 {hard copy will be provided}	
	28	Phenylketonuria	DP Brenton & J Pietz <i>Eur J Pediatr</i> 159 (2000):S114-20 {=pdf}	NL ch29 (pp444-447)
	29	Final review and conclusions		
11-Dec	<i>Final papers due</i>			