

Teacher(s)	Noël Marie-Pascale ;
Language :	French
Place of the course	Louvain-la-Neuve
Learning outcomes	
Evaluation methods	The certification evaluation is carried out by a written exam containing mostly open questions requiring a short and precise answer. The exam may also include some multiple choice questions. During the September session, if a very small number of students are registered for the exam, the teacher may decide to propose an oral exam instead of a written exam.
Teaching methods	Lecture by the teacher.
Content	<p>Topics: Cognitive bases of numerical development in typical children and in people with dyscalculia- Proto-numerical tools in babies, including the analog line metaphor (or ANS: approximate number system)</p> <ul style="list-style-type: none"> <li>- Counting (development of the verbal numerical chain) and enumeration (principles and development of sets counting)</li> <li>- Symbolic codes :</li> <li>- oral/written verbal numbers, arabic numbers, lexicon, syntax, transcoding</li> <li>- base 10 representation</li> <li>- Access to the magnitude of large numbers</li> <li>- Link between these basic numerical capabilities and arithmetic performance</li> <li>- Calculation :</li> </ul> <ol style="list-style-type: none"> <li>1. o Sensitivity to additions-removals in babies; non-verbal calculations in infants, approximate calculation ;</li> <li>2. o strategy development, Siegler's association distribution model, base 10 for complex calculations</li> </ol> <ul style="list-style-type: none"> <li>- word problem solving</li> <li>- Rational numbers: decimal numbers and fractions</li> <li>- Dyscalculia :</li> </ul> <ol style="list-style-type: none"> <li>1. o definition, prevalence, difficulties presented, associations with other disorders,</li> <li>2. o causal hypotheses (genetic contribution; role of general cognitive factors, deficit in basic numerical factors, etc.)</li> <li>3. o neuro-functional correlates</li> <li>4. - Rehabilitation and experimental training</li> </ol> <ul style="list-style-type: none"> <li>- Special issues that may be considered:</li> </ul> <ol style="list-style-type: none"> <li>1. relationship between fingers and numbers ;</li> <li>2. hypersensitivity to interference in arithmetic fact deficits;</li> <li>3. deficit of the semantic representation of number in visuo-spatial dyspraxias.</li> </ol>
Inline resources	<p>Pdf documents corresponding to the slides of the course are available on moodle.</p> <p>Other ressource: a synthesis from INSERM</p> <p><a href="http://www.ipubli.inserm.fr/bitstream/handle/10608/110/Synthese.html#titre_n1_10">http://www.ipubli.inserm.fr/bitstream/handle/10608/110/Synthese.html#titre_n1_10</a></p>
Bibliography	<p>Ouvrages de référence:</p> <ol style="list-style-type: none"> <li>1. Noël, M.-P. &amp; Karagiannakis, G. (2020). <i>Dyscalculie et difficultés d'apprentissage en mathématiques. Guide pratique de prise en charge</i>. De Boeck supérieur, Louvain-la-Neuve, Belgique, 317 pages, ISBN : 978-2-8073-1899-1</li> <li>2. Noël, M.P. &amp; Karagiannakis, G. (2022). <i>Effective teaching strategies for dyscalculia and learning difficulties in mathematics. Perspectives from cognitive neuroscience</i>. Routledge, New York, 303 pages, ISBN 9781032151434.</li> </ol>
Other infos	<p>Support: documents, powerpoint presentations etc available on Moodle, references to published articles; book in English can be used as a very good support for the course.</p> <p>The standard exam is a written exam in French. However, international students taking this course:</p> <ul style="list-style-type: none"> <li>• Will be allowed to use a dictionary when taking the written exam in French</li> <li>• Are provided with the opportunity to write all their answers in English</li> </ul>

Faculty or entity in charge	ELOG
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Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Psychology and Education : Speech and Language Therapy	LOGO1BA	4		