



## Teaching Guide

Identifying Data					2017/18
<b>Subject (*)</b>	Learning difficulties in Mathematics. Practical approach		<b>Code</b>	652513222	
<b>Study programme</b>	Mestrado Universitario en Didácticas Específicas				
Descriptors					
<b>Cycle</b>	<b>Period</b>	<b>Year</b>	<b>Type</b>	<b>Credits</b>	
Official Master's Degree	2nd four-month period	First	Optativa	3	
<b>Language</b>	Galician				
<b>Teaching method</b>	Face-to-face				
<b>Prerequisites</b>					
<b>Department</b>	Pedagogía e Didáctica				
<b>Coordinador</b>	Soneira Calvo, Carlos	<b>E-mail</b>	carlos.soneira@udc.es		
<b>Lecturers</b>	Soneira Calvo, Carlos Torre Fernandez, Enrique de la	<b>E-mail</b>	carlos.soneira@udc.es enrique.torref@udc.es		
<b>Web</b>					
<b>General description</b>					

## Study programme competences / results

Code	Study programme competences / results
A1	To know the theoretical basis of interdisciplinary work and identify its centre of interest in school and non-school contexts.
A2	To identify and critically analyse interdisciplinary proposals in the educational world.
A3	To design, justify and evaluate in a systematic manner interdisciplinary proposals in different educational contexts.
A8	To be able to defend and argue in oral and written ways the completed investigation and/or innovation work, using audio-visual aids.
A9	To test and evaluate disciplinary and interdisciplinary teaching projects in real educational contexts and to promote suggestions for improvement related to the obtained results.
A11	To know and understand scientific language and use it correctly in different ways of expression and communication.
A15	To identify quality and control criteria both in research and in the teaching practice, encouraging a critical, reflective and innovative spirit.
A16	To design, justify and evaluate research and innovation projects in the field of Specific Didactics.
A17	To select, adapt and apply materials, resources and ICTs to improve the teaching and learning in different disciplinary fields.
B1	To have and understand general knowledge to establish foundations and /or opportunities to stand out in the development and implementation of ideas, mainly in an action- research context.
B2	To be able to apply the acquired foundations and their problem-solving capabilities in new multidisciplinary contexts related to the specific research areas.
B3	To be able to join contents and accept the challenge to formulate complex statements out of a limited or incomplete information, including reflections about social and ethic responsibilities related to the application of their own knowledge and opinions.
B4	To be able to transfer and communicate their conclusions and opinions in a clear and straight manner both in a specialized and a non-specialized audience.
B5	To have the required learning abilities to continue in a life-long-learning and autonomous process.
B6	To be able to analyse and synthesize.
B7	To be able to adapt to new situations.
B8	To work with initiative and in an autonomous way.
B9	To work in a collaborative way.
B10	To be able to organize and plan in curricular and cross-curricular subjects.
B11	To be able to innovate (creativity) within educational and non-educational contexts.
B12	to behave with ethics and with social and environmental responsibility as a teacher and/or researcher.
B13	To be able to communicate with their peers, educational community and with society in general in the field of their areas of knowledge.
B14	To incorporate ICTs for the research process, information management, data analysis and for transferability.
B15	To be able to update knowledge, methodologies and strategies in their teaching practices
C1	To express correctly, both orally and in written texts, in the two co-official languages of the Autonomous Community.
C3	To use the main ICT's basic tools for their professional development and for their life-long-learning process.



C4	To be able to self-develop for an open, critical, committed, democratic and solidary citizenship.
C6	To critically value available knowledge, technology and information to solve problems which students must face.
C7	To assume as a professional and as a citizen the importance of life-long-learning.
C8	To value the importance that research, innovation and technical developments have on society's socio-economical and cultural progress.

Learning outcomes			
Learning outcomes	Study programme competences / results		
Coñecer e analizar as dificultades asociadas aos distintos tipos de linguaxe e a súa interrelación na educación matemática.	AJ1	BJ6	CJ1
	AJ2	BJ7	CJ3
	AJ8	BJ8	CJ4
	AJ11	BJ10	CJ6
	AJ16	BJ13	CJ7
	AJ17	BJ14	CJ8
	BJ15		
Coñecer os principios, técnicas e recursos didácticos para dar resposta ás dificultades asociadas ao uso das distintas linguaxes en matemáticas.	AJ3	BJ1	CJ1
	AJ9	BJ2	CJ8
		BJ3	
		BJ4	
		BJ5	
		BJ11	
	BJ12		
Coñecer a influencia das compoñentes afectivas no proceso de ensino-aprendizaxe da matemática.	AJ2	BJ6	CJ1
	AJ3	BJ7	CJ3
	AJ8	BJ9	CJ4
	AJ11	BJ12	CJ6
	AJ15	BJ13	CJ7
			CJ8
Adquirir a capacidade de resolver situacións prácticas relativas ás dificultades da aprendizaxe da matemática.	AJ1	BJ6	CJ1
	AJ2	BJ7	CJ4
	AJ3	BJ9	CJ6
	AJ8	BJ10	CJ7
	AJ9	BJ11	CJ8
	AJ16	BJ12	
	AJ17	BJ13	
		BJ15	

Contents	
Topic	Sub-topic
As linguaxes da matemática	<p>Importancia do uso simultáneo de linguaxes distintas na actividade matemática.</p> <p>A linguaxe verbal</p> <p>A linguaxe simbólica</p> <p>A linguaxe gráfica</p>



Compoñentes afectivos.	Actitudes cara as matemáticas  Ansiedade matemática  Influencia das compoñentes afectivas no desempeño matemático
Análise e estudo de casos prácticos.	Dificultades en contexto  Resposta ás dificultades  Metacognición en matemáticas  Tarefas auténticas e tarefas estándar  Implementación práctica de actividades metacognitivas na aula

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Document analysis	A11 A15 A17 B3 B5 B8 B15 C3 C6	0	15	15
Collaborative learning	A3 A8 A16 A17 B1 B2 B3 B5 B6 B7 B9 B10 B11 B12 B13 B14 B15 C1	8	8	16
Directed discussion	A8 A11 A15 A17 B4 B6 B9 B12 B13	3	5	8
Research (Research project)	A1 A2 A3 A8 A9 A11 A15 A16 A17 B1 B6 B7 B9 B10 B11 B12 B13 B14 B15 C1 C3 C4 C6 C7 C8	5	20	25
Oral presentation	A8 A11 B6 B10 B13 C1	1	3	4
Introductory activities	A1 A2 B2 B6	4	2	6
Personalized attention		1	0	1

(\*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
Methodologies	Description
Document analysis	Utilización de documentos de toda tipoloxía, aplicables e relacionados coas didácticas específicas (primarias, secundarias e terciarias: arquivísticos, bibliográficos, audiovisuais, hemerográficos, arqueolóxicos, orais, textuais, literarias, etc.) relevantes para a temática da materia con actividades especificamente deseñadas para o traballo coas mesmas.
Collaborative learning	Realización de traballos en grupos.
Directed discussion	Posta en común dos contidos analizados nas fontes documentáis. Discusión sobre a súa aplicabilidade.
Research (Research project)	Proceso orientado á aprendizaxe do alumnado mediante a realización de actividades de carácter práctico a través das que se propoñen situacións que requiren ao estudante identificar un problema obxecto de estudo, formulalo con precisión, desenvolver os procedementos pertinentes, interpretar os resultados e sacar as conclusións oportunas do traballo realizado.



Oral presentation	Exposición verbal, coa utilización dos recursos expositivos adecuados, que debe reflectir todas as fases do proceso de creación e desenvolvemento dos traballos titelados.
Introductory activities	Presentación das liñas xerais da materia e toma de contacto cos estudantes, os seus intereses e expectativas.

## Personalized attention

Methodologies	Description
Research (Research project)	Orientación dos grupos de estudantes na realización do traballo.

## Assessment

Methodologies	Competencies / Results	Description	Qualification
Research (Research project)	A1 A2 A3 A8 A9 A11 A15 A16 A17 B1 B6 B7 B9 B10 B11 B12 B13 B14 B15 C1 C3 C4 C6 C7 C8	Traballo en equipo ou individual sobre un tema de interese. Terase en conta a dificultade do tema elixido, a metodoloxía seguida na súa realización, a exposición dos resultados atopados e a argumentación das conclusións, entre outras cousas.	60
Oral presentation	A8 A11 B6 B10 B13 C1	O alumnado terá que facer a presentación oral e defensa dun traballo. Terase en conta a corrección na expresión oral, capacidade de síntese, capacidades comunicativas, así como a corrección e argumentación das respostas e a súa adecuación ás posibles cuestións que se formulen.	10
Collaborative learning	A3 A8 A16 A17 B1 B2 B3 B5 B6 B7 B9 B10 B11 B12 B13 B14 B15 C1	Terase en conta a participación razoada, a realización razoada das tarefas e a aportación ás dinámicas de grupo.	30

## Assessment comments



Non se admite a dispensa académica de exención de docencia.

Se o

estudante non chega a unha asistencia do 80% das clases presenciales deberá ser evaluado por unha proba individual.

Nos traballos de avaliación que se entreguen, os

contidos incluídos deben estar apropiadamente referenciados ao longo do traballo e no apartado de referencias usando certas normas. O texto literal debe declararse usando ditas normas. No parafraseado deben figurar as fontes orixinais das ideas que se reelaboran. A presenza de fontes científicas no traballo é un signo de credibilidade que é un requisito imprescindible para demostrar a excelencia académica.

Recoméndase consultar:

[http://www.udc.es/biblioteca/servizos/apoio\\_investigacion/servizos\\_apoio/publicar/citar.html](http://www.udc.es/biblioteca/servizos/apoio_investigacion/servizos_apoio/publicar/citar.html)

Tense que evitar o plaxio.

As citas e as referencias a calquera texto debe declararse, o uso literal do texto ou ideas doutros autores parafraseadas sen declarar a fonte supón o

suspense do traballo en aplicación do artigo 14.4 da **NORMAS DE AVALIACIÓN, REVISIÓN E RECLAMACIÓN DAS CUALIFICACIÓNS DOS ESTUDOS DE GRAO E MESTRADO UNIVERSITARIO**, aprobada polo

Consello de Goberno do

19 de decembro de 2013 e modificada o 29 de xaneiro de 2015, na que se indica que "na realización de traballos,

o plaxio e a utilización de material non orixinal, incluído aquel obtido a

través de internet, sen indicación expresa da súa

procedencia e, se é o caso, o

permiso do seu autor/a, poderá ser considerada causa de cualificación de suspense

na actividade".



<p><b>Basic</b></p>	<p>- van Velzen, Joke H. (2016). Evaluating the suitability of mathematical thinking problems for senior high-school students by including mathematical sense making and global planning. THE CURRICULUM JOURNAL</p> <p>Bayetto, Anne Free Tips and Resources for Phonics Teaching. What does the research tell us?  <a href="http://www.speld-sa.org.au/links/free-tips-and-resources-for-phonics-teaching.html?task=view&amp;id=84">http://www.speld-sa.org.au/links/free-tips-and-resources-for-phonics-teaching.html?task=view&amp;id=84</a>Effective Strategies for Teaching Students with Difficulties in Mathematics. The National Council of Teachers of Mathematics. 2007.</p> <p><a href="http://www.nctm.org/uploadedFiles/Research_and_Advocacy/research_brief_and_clips/Research_brief_02_-_Effective_Strategies.pdf">http://www.nctm.org/uploadedFiles/Research_and_Advocacy/research_brief_and_clips/Research_brief_02_-_Effective_Strategies.pdf</a>Kramarski, Bracha; Mevarech, Zemira R.; Arami, Marsel (2002) The effects of metacognitive instruction on solving Mathematical authentic tasks. Educational Studies in Mathematics 49: 225-250</p> <p>Munro, J. (1995). SUCCESS in learning mathematics : A learning strategies approach. Hawthorn, VIC : EdAssist.  <a href="https://students.education.unimelb.edu.au/selage/pub/readings/mathsls/LD-N%20%20teaching%20framework.pdf">https://students.education.unimelb.edu.au/selage/pub/readings/mathsls/LD-N%20%20teaching%20framework.pdf</a></p> <p>Munro, John (2003) Dyscalculia : A unifying concept in understanding mathematics learning disabilities. Australian Journal of Learning Disabilities, 2003 8, (4).  <a href="https://students.education.unimelb.edu.au/selage/pub/readings/mathsls/Types_of_dyscalcula.pdf">https://students.education.unimelb.edu.au/selage/pub/readings/mathsls/Types_of_dyscalcula.pdf</a></p> <p>Munro, John. Mathematics underachievers learning spatial knowledge.  <a href="https://students.education.unimelb.edu.au/selage/pub/readings/mathsls/Spatial%20article.pdf">https://students.education.unimelb.edu.au/selage/pub/readings/mathsls/Spatial%20article.pdf</a></p> <p>Naya, M<sup>a</sup> Cristina; Soneira, Carlos; Mato, M<sup>a</sup> Dorinda; de la Torre, Enrique (2014) Cuestionario sobre actitudes hacia las matemáticas en futuros maestros de Educación Primaria. Revista de Estudios e Investigación en Psicología y Educación. Vol.1, No. 2, 141-149</p> <p>Naya-Riveiro, M.C., Soneira, C., Mato, D. y de la Torre, E. (2015). Actitudes hacia las Matemáticas y rendimiento académico en función de los estudios de acceso y curso en futuros maestros. En C. Fernández, M. Molina y N. Planas (eds.), Investigación en Educación Matemática XIX (pp. 423-430). Alicante: SEIEM.</p> <p>Orrantia, Josetxu; Tarín, Julio &amp; Vicente, Santiago (2011) El uso de la información situacional en la resolución de problemas aritméticos, Infancia y Aprendizaje, 34:1, 81-94. <a href="http://dx.doi.org/10.1174/021037011794390094">http://dx.doi.org/10.1174/021037011794390094</a></p> <p>Orrantia, Josetxu; González, Lourdes B.; Vicente, Santiago (2005) Un análisis de los problemas aritméticos en los libros de texto de Educación Primaria. Infancia y Aprendizaje, 28 (4), 429-451</p> <p>Phonapichat, Prathana; Wongwanich, Suwimon; Sujiva, (2014) An analysis of elementary school students' difficulties in mathematical problem solving Siridej Procedia - Social and Behavioral Sciences, 116, pp. 3169-3174  <a href="http://www.sciencedirect.com/science/article/pii/S1877042814007459">http://www.sciencedirect.com/science/article/pii/S1877042814007459</a></p> <p>Soneira, Carlos; Naya, M<sup>a</sup> Cristina; Mato, M<sup>a</sup> Dorinda; de la Torre, Enrique (2015) Autoconcepto matemático de los estudiantes de grado de Educación Primaria. En Ramiro-Sánchez, T. y Ramiro, M.T. (2015) Avances en Ciencias de la Educación y del Desarrollo 2015. San Sebastián: Univ. de Granada. Pp. 521-526.</p> <p>Turner, R. (2016). Lessons from PISA 2012 about mathematical literacy: An illustrated essay. PNA, 10(2), 77-94</p> <p>Verschaffel, L.; DeCorte, E.; Lasure, S (1994) Realistic considerations in mathematical modeling of school arithmetic word problems. Learning and Instruction 4(4):273-294.  <a href="https://www.researchgate.net/publication/223690245_Realistic_considerations_in_mathematical_modeling_of_school_arithmetic_word_problems">https://www.researchgate.net/publication/223690245_Realistic_considerations_in_mathematical_modeling_of_school_arithmetic_word_problems</a></p>
<p><b>Complementary</b></p>	

**Recommendations**

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments



Recoméndase

os envíos dos traballos telemáticamente e, de non ser posible, non utilizar plásticos.

Elixir a impresión a dobre cara, empregar papel reciclado e evitar imprimir borradores. Débese facer un uso sostible dos recursos e a prevención de impactos negativos sobre o medio natural. Débese ter en conta a importancia dos principios éticos relacionados cos valores da sustentabilidade nos comportamentos persoais e profesionais.

(\*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.