FACULTAD DE CIENCIAS DE LA EDUCACIÓN Y PSICOLOGÍA

GRADO DE EDUCACIÓN PRIMARIA

2024/25 YEAR

DIDÁCTICA DE LAS OPERACIONES NUMÉRICAS Y LA MEDIDA

Course details

Course name: DIDÁCTICA DE LAS OPERACIONES NUMÉRICAS Y LA MEDIDA
Code: 100816
Degree/Master: GRADO DE EDUCACIÓN PRIMARIA **Year:** 2
Name of the module to which it belongs: ENSEÑANZA Y APRENDIZAJE DE LAS MATEMÁTICAS
Field: DIDÁCTICA DE LAS OPERACIONES NUMÉRICAS Y LA MEDIDA
Character: OBLIGATORIA **Duration:** SECOND TERM
ECTS Credits: 6.0 **Classroom hours:** 60
Face-to-face classroom percentage: 40.0% **Study hours:** 90
Online platform: https://moodle.uco.es/

Coordinating teacher

Name: MARTÍNEZ JIMÉNEZ, ENRIQUE
Department: MATEMÁTICAS
Office location: Planta Alta Módulo A
E-Mail: z22majie@uco.es **Phone:** 957212543

Brief description of the contents

This is the second subject of the degree in the area of Didactics of Mathematics. There are five blocks in which students work competences related to the didactics of number and measurement.

Prerequisites

Prerequisites established in the study plan

None.

Recommendations

It is essential to review knowledge of the Natural, Rational and Integer Numbers, and of the basic magnitudes and their metric systems, as the subject of study of the course focuses on the processes of transmission of such knowledge under the conditions established by the Compulsory Education System.
It is recommended that students follow the subject on a continuous basis throughout the term.

Study programme

1. Theory contents

Block 1: Didactics of Natural numbers.
Block 2: Didactics of Integers.
Block 3: Didactics of Rational numbers.
Block 4: Didactics of the measurement of length, surface area and volume.
Block 5: Didactics of the measurement of weight, time and monetary value.

2. Practical contents

Those related to methodological alternatives and the use of didactic resources related to theoretical contents.

Bibliography

Adamuz-Povedano, N., Fernández-Ahumada, E., García-Pérez, M. T., & Montejo-Gámez, J. (2021). Developing Number Sense: An Approach to Initiate Algebraic Thinking in Primary Education. Mathematics, 9(5), 518. https://doi.org/10.3390/math9050518

Albanese, V., Adamuz-Povedano, N., & Bracho-López, R. (2015). Algoritmos alternativos y cálculo mental en las comunidades gitanas. In M. I. Amor, J. L. Luengo, & M. Martínez (Eds.), Educación Intercultural: metodología de aprendizaje en contextos bilingües (pp. 55–59). Granada: Atrio.

AA.VV. (2003). Didáctica de las matemáticas para Educación Primaria. (M. C. Chamorro, Ed.). Madrid: Pearson Educación.

Blanco Nieto, L. J., Cárdenas Lizarazo, J. A., & Caballero Carrasco, A. (2015). La resolución de problemas de Matemáticas en la formación inicial de profesores de Primaria. Investigación en Educación Matemática XIX. https://doi.org/10.1016/S0944-7113(11)80011-5

Chamorro, M. del C., & Belmonte, J. M. (1996). El problema de la medida. Didáctica de las magnitudes lineales. Madrid: Editorial Síntesis.

Dehaene, S. (1997). The number sense. New York: Oxford University Press.

Dehaene, S. (2016). El cerebro matemático. Buenos Aires: Siglo XXI editores.

Echenique, I. (2006). Matemáticas resolución de problemas. Gobierno de Navarra.

Flores, P., & Rico, L. (2015). Enseñanza y aprendizaje de las matemáticas en Educación Primaria. Madrid: Pirámide.

García-Pérez, T., & Adamuz-Povedano, N. (2019). Del número al sentido numérico y de las cuentas al cálculo táctico. Barcelona: Octaedro.

Haylock, D. (2010). Mathematics Explained for primary teachers (4th ed.). Sage Publications Ltd.

Kennedy, L., Tipps, S., & Johnson, A. (2007). Guiding children's learning of mathematics. Cengage Learning.

Martínez Montero, J., Sánchez Cortés, C., & De la Rosa, J. M. (2020). Enseñar matemáticas con el método ABN. Wolters Kluwer.

Molina Ayuso, Á., Adamuz Povedano, N., & Bracho López, R. (2020). La resolución de problemas basada en el Método de Polya usando el pensamiento computacional y Scratch con estudiantes de Educación Secundaria. Aula Abierta, 49(1), 83–90. https://doi.org/10.17811/rifie.49.1.2020.83-90

Montoro, V., Cifuentes, M., Salva, N., & Bianchi, M. J. (2017). Students' understanding of the number line / Estudiantes pensando en la recta numérica. Infancia y Aprendizaje, 40(2), 302–342. https://doi.

org/10.1080/02103702.2017.1304879
Pedrosa-Jesús, C., León-Mantero, C., Cuida Gómez, M.A. (2020). Estudio de las actitudes hacia las matemáticas en los Grados en Educación Infantil y Primaria. Matemáticas, Educación y Sociedad, 3 (3), 18-28.
Resnick, M., Maloney, J., Rusk, N., Eastmond, E., Brennan, K., Millner, A., Rosenbaum, E., Silver, J., Silverman, B., & Kafai, Y. (2009). Scratch: Programing for all. Comunication of the ACM, 52(11), 62–67. https://doi.org/10.1145/1592761.1592779
Rico, L., Lupiañez, J. L., & Molina, M. (2013). Análisis Didáctica en Educación Matemática. Granada: Comares.
Socas, M. (2011). Aprendizaje y enseñanza de las Matemáticas en Educación Primaria. Buenas Prácticas. Educatio Siglo XXI, 29 (2), 199–224.
Sowder, J. (1992). Estimation and number sense. In D. A. Grouws (Ed.), Handbook of Research in Mathematics Teaching and Learning (pp. 371–389). New York: Macmillan Publishing Co.
Van de Walle, J. A. (2019). Elementary and middle school mathematics: Teaching developmentally (Tenth ed.). Pearson.
Wing, J. (2006). Computational Thinking. Comunication of the ACM, 49(3), 33–35.

Methodology

General clarifications on the methodology (optional)

The design of the course is based on frequent student-teacher interaction.
The Virtual Classroom of the UCO and other electronic resources will be used for the development of the subject.
The use of manipulative and virtual materials will also be encouraged.
Teachers will present and develop the topics of the programme, as well as the relevant activities for a better understanding of the contents, expecting active and concerned participation from the students.
In practical classes, work in small groups with manipulative or virtual resources will be encouraged. Teachers will present the activity, providing a script, guiding the work and attending to any doubts that may arise.

Methodological adaptations for part-time students and students with disabilities and special educational needs

The person in charge of the subject may establish the monitoring mechanisms that he/she considers appropriate in relation to students enrolled part-time.
In the case of students with special educational needs, the recommendations given by the Inclusive Education Unit (UNEI) will be followed.

Face-to-face activities

Activity	Large group	Medium group	Total
Assessment activities	4	-	4
Information processing activities	3	2.5	5.5
Oral communication activities	5	2.5	7.5
Practical experimentation activities	10	5	15

Activity	Large group	Medium group	Total
Projects based on the course contents	20	-	20
Written expression activities	3	5	8
Total hours:	***45***	***15.0***	***60.0***

Off-site activities

Activity	Total
Exercise and problem solving activities	30
Information processing activities	50
Information search activities	10
Total hours	***90***

Results of the training and learning process

Knowledge, competencies and skills

CB2 Students must know how to apply their knowledge to their job or vocation in a professional manner and they must possess the competencies which are usually demonstrated by means of the elaboration and defense of arguments and the solution of problems in their field of study.

CB3 Students have the ability to gather and interpret relevant data (usually within their field of study) to inform judgements that include reflection on relevant social, scientific or ethical issues.

CB4 Students can communicate information, ideas, problems and solutions to specialist and non-specialist audiences.

CB5 Students must develop those necessary learning abilities to undertake subsequent studies with a high degree of autonomy.

CU2 To know and improve the user level in the field of ICT.

CE1 Knowledge of the curricular areas of primary education, the interdisciplinary relationship between them, evaluation criteria and the body of knowledge on teaching methods regarding procedures.

CE10 Reflect on classroom practices to innovate and improve teaching. Acquire habits and skills for independent and cooperative learning and foster them in students.

CE11 Knowledge of and ability to apply information and communication technologies in the classroom. Ability to selectively distinguish audiovisual information that contributes to learning, civic education and cultural wealth.

CM6.6 To develop and evaluate curriculum contents through appropiate didactic resources and promote the acquisition of relevant competences among students (in musical, Visual Arts Education).

Assessment methods and instruments

Intended learning outcomes	Examination	Group or individual globalizing projects	Means of practical execution	Students assignments
CB2	X	X	X	X
CB3		X	X	X
CB4	X	X		X
CB5		X	X	X
CE1	X	X		X
CE10		X	X	X
CE11		X	X	X
CM6.6	X	X	X	X
CU2		X		X
Total (100%)	***50%***	***10%***	***10%***	***30%***
Minimum grade (*)	***5***	***0***	***5***	***5***

(*)Minimum mark (out of 10) needed for the assessment tool to be weighted in the course final mark. In any case, final mark must be 5,0 or higher to pass the course.

General clarifications on instruments for evaluation:

Examination: Written test of the ordinary and extraordinary calls of the subject.
Means of practical execution (problem solving): Written test, consisting of solving and analysing problems taken from official Primary Mathematics textbooks, using the curricular resources of the area (basic knowledge, notions and skills) appropriate to the educational level that corresponds to each exercise. This test will take place before the end of the school term.
Students assignments (Lab sessions): This consists of the delivery of the specific work indicated by the teachers during the teaching period in which the subject is taught.
Group or individual globalizing projects (Active participation): This includes significant individual activity by students in class and forums, complementary problem solving and any other activity that is proposed for the development of competences to be acquired.
The activities in medium-sized groups (Lab sessions) are compulsory and face-to-face. Unjustified absence from 20% of the medium-sized group activities will result in failing this part of the course.
In order to pass the course, it will be necessary to obtain a grade equal to the minimum mark indicated in each evaluation instrument. As well as demonstrating a good level of linguistic and communicative competence. Lack of accuracy in the production of oral or written texts may have a negative impact on the final grade.
In the event that a student does not achieve the minimum mark in any of these instruments, the marks for the assessment instruments passed will only be kept for the current academic year.
The Group or individual globalizing projects (active participation), the Students assignments (Lab sessions) and the Means of practical execution (problem solving) constitute the continuous

assessment of the subject.
The assessment corresponding to Group or individual globalizing projects (active participation) cannot be recovered in the second or extraordinary call.
The person in charge of the subject may establish the adaptations that he/she considers appropriate in relation to second or successive enrolments.

Clarifications on the methodology for part-time students and students with disabilities and special educational needs:

The person in charge of the subject may establish the adaptations he/she considers appropriate in relation to students enrolled part-time.
In the case of students with special educational needs, the recommendations given by the Inclusive Education Unit (UNEI) will be followed.

Clarifications on the evaluation of the extraordinary call and extra-ordinary call for completion studies:

The marks of the assessment instruments passed in any of the assessment periods will be kept only for the current academic year.

Qualifying criteria for obtaining honors:

Defined in the Academic Regulations of the University of Cordoba.

Sustainable development goals

Quality education
Gender equality

The methodological strategies and the evaluation system contemplated in this Teaching Guide will respond to the principles of equality and non-discrimination and must be adapted according to the needs presented by students with disabilities and special educational needs in the cases that are required. Students must be informed of the risks and measures that affect them, especially those that may have serious or very serious consequences (article 6 of the Safety, Health and Welfare Policy; BOUCO 23-02-23).