



## Teaching Guide

| Teaching Guide      |                                                                                                                                                                                                                                                                                                                                                                                                                |        |                                                                             |           |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------|-----------|
| Identifying Data    |                                                                                                                                                                                                                                                                                                                                                                                                                |        | 2019/20                                                                     |           |
| Subject (*)         | Education in Mathematics I                                                                                                                                                                                                                                                                                                                                                                                     | Code   |                                                                             | 652G02008 |
| Study programme     | Grao en Educación Primaria                                                                                                                                                                                                                                                                                                                                                                                     |        |                                                                             |           |
| Descriptors         |                                                                                                                                                                                                                                                                                                                                                                                                                |        |                                                                             |           |
| Cycle               | Period                                                                                                                                                                                                                                                                                                                                                                                                         | Year   | Type                                                                        | Credits   |
| Graduate            | 2nd four-month period                                                                                                                                                                                                                                                                                                                                                                                          | First  | Obligatory                                                                  | 6         |
| Language            | SpanishGalician                                                                                                                                                                                                                                                                                                                                                                                                |        |                                                                             |           |
| Teaching method     | Face-to-face                                                                                                                                                                                                                                                                                                                                                                                                   |        |                                                                             |           |
| Prerequisites       |                                                                                                                                                                                                                                                                                                                                                                                                                |        |                                                                             |           |
| Department          | Pedagogía e Didáctica                                                                                                                                                                                                                                                                                                                                                                                          |        |                                                                             |           |
| Coordinador         | Naya Riveiro, Maria Cristina                                                                                                                                                                                                                                                                                                                                                                                   | E-mail | cristina.naya@udc.es                                                        |           |
| Lecturers           | Naya Riveiro, Maria Cristina<br>Segade Pampín, María Elena<br>Soneira Calvo, Carlos                                                                                                                                                                                                                                                                                                                            | E-mail | cristina.naya@udc.es<br>elena.segade.pampin@udc.es<br>carlos.soneira@udc.es |           |
| Web                 |                                                                                                                                                                                                                                                                                                                                                                                                                |        |                                                                             |           |
| General description | In this matter pretends describe and analyse the processes that take part in the learning of the mathematics in the Primary Education, as well as know methods, technical and resources for his work in the classroom.<br><br>Also it wants to show the paper that represents the mathematics in the current society, his paper along the history and the paper that plays on the way to a critical education. |        |                                                                             |           |

## Study programme competences

| Code | Study programme competences                                                                                                                                                                                                                                                                                                            |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A38  | Adquirir competencias matemáticas básicas (numéricas, cálculo, xeométricas, representacións espaciais, estimación e medida, organización e interpretación da información, etc.).                                                                                                                                                       |
| A39  | Cofecer o currículo escolar de matemáticas. Analizar, razoar e comunicar propostas matemáticas.                                                                                                                                                                                                                                        |
| A40  | Formular e resolver problemas vinculados coa vida cotiá.                                                                                                                                                                                                                                                                               |
| A41  | Valorar a relación entre matemáticas e ciencias como un dos pilares do pensamento científico.                                                                                                                                                                                                                                          |
| A42  | Desenvolver e avaliar contidos do currículo mediante recursos didácticos apropiados e promover as competencias correspondentes nos estudantes.                                                                                                                                                                                         |
| B1   | Aprender a aprender.                                                                                                                                                                                                                                                                                                                   |
| B2   | Resolver problemas de forma efectiva.                                                                                                                                                                                                                                                                                                  |
| B3   | Aplicar un pensamento crítico, lóxico e creativo.                                                                                                                                                                                                                                                                                      |
| B4   | Traballar de forma autónoma con iniciativa.                                                                                                                                                                                                                                                                                            |
| B5   | Traballar de forma colaborativa.                                                                                                                                                                                                                                                                                                       |
| B8   | Capacidade para elaborar discursos coherentes e organizados lóxicamente.                                                                                                                                                                                                                                                               |
| B9   | Capacidade para expoñer as ideas elaboradas, de forma oral e na escrita.                                                                                                                                                                                                                                                               |
| B10  | Capacidade de expresión oral e escrita en varias linguas (a lo menos nunha lingua estranxeira).                                                                                                                                                                                                                                        |
| B11  | Capacidade de comprensión dos distintos códigos audiovisuais e multimedia e manexo das ferramentas informáticas.                                                                                                                                                                                                                       |
| B12  | Capacidade de selección, de análise, de avaliación e de utilización de distintos recursos na rede e multimedia.                                                                                                                                                                                                                        |
| B15  | Capacidade para utilizar diversas fontes de información, seleccionar, analizar, sintetizar e extraer ideas importantes e xestionar a información.                                                                                                                                                                                      |
| B18  | Compromiso ético para o exercicio das tarefas docentes.                                                                                                                                                                                                                                                                                |
| B19  | Capacidade de adaptarse a novas situacións nunha sociedade cambiante e plural.                                                                                                                                                                                                                                                         |
| B21  | CB1 - Que os estudantes demostrasen posuír e comprender coñecementos nunha área de estudo que parte da base da educación secundaria xeneral, e se adoita encontrar a un nivel que, se ben se apoia en libros de texto avanzados, inclúe tamén algúns aspectos que implican coñecementos procedentes da vangarda do seu campo de estudo |
| B22  | CB2 - Que os estudantes saiban aplicar os seus coñecementos ao seu traballo ou vocación dunha forma profesional e posúan as competencias que adoitan demostrarse por medio da elaboración e defensa de argumentos e a resolución de problemas dentro da súa área de estudo                                                             |



|     |                                                                                                                                                                                                                                                        |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B23 | CB3 - Que os estudantes teñan a capacidade de reunir e interpretar datos relevantes (normalmente dentro da súa área de estudo) para emitir xuízos que inclúan unha reflexión sobre temas relevantes de índole social, científica ou ética              |
| B24 | CB4 - Que os estudantes poidan transmitir información, ideas, problemas e solucións a un público tanto especializado como non especializado                                                                                                            |
| B25 | CB5 - Que os estudantes desenvolvesen aquelas habilidades de aprendizaxe necesarias para emprender estudos posteriores cun alto grao de autonomía                                                                                                      |
| C1  | Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.                                                                                                                                               |
| C3  | Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.                                                                        |
| C4  | Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común. |
| C6  | Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.                                                                                                                      |
| C7  | Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.                                                                                                                                                                       |
| C8  | Valorar a importancia que ten a investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade.                                                                                                          |

| Learning outcomes                                                     |                             |                                                                                         |                                  |
|-----------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------|----------------------------------|
| Learning outcomes                                                     | Study programme competences |                                                                                         |                                  |
| Boost and develop the knowledge of basic mathematical concepts.       | A38                         | B1<br>B2<br>B3<br>B4<br>B5<br>B8<br>B9<br>B10<br>B11<br>B12<br>B15<br>B18<br>B19<br>B21 | C1<br>C3<br>C4<br>C6<br>C7<br>C8 |
| The mathematicians in the school curriculum of the Primary Education. | A39                         | B1<br>B2<br>B3<br>B4<br>B8<br>B9<br>B10<br>B11<br>B12<br>B15<br>B18<br>B19              | C1<br>C3<br>C4<br>C6<br>C7<br>C8 |



|                                                                                                                                                                                                   |                                 |                                                                                                              |                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------|
| With the aim that the students experience the utility of the mathematicians in the world that surrounds them day to day, will resolve mathematical problems and no propiamente mathematicians.    | A40                             | B1<br>B2<br>B3<br>B4<br>B5<br>B8<br>B9<br>B10<br>B11<br>B12<br>B15<br>B18<br>B19                             | C1<br>C3<br>C4<br>C6<br>C7<br>C8 |
| Evaluate and analyze the teaching and the learning of the mathematicians in the stage of Primary Education using didactic resources.                                                              | A42                             | B1<br>B2<br>B3<br>B4<br>B5<br>B8<br>B9<br>B10<br>B11<br>B12<br>B15<br>B18<br>B19                             | C1<br>C3<br>C4<br>C6<br>C7<br>C8 |
| O progreso científico, en todas as súas ramas, require unha estreita e forte interacción coa matemática; de aquí a necesidade de valorar a forte e longa relación entre a matemática e a ciencia. | A41                             | B1<br>B2<br>B3<br>B4<br>B5<br>B8<br>B9<br>B10<br>B11<br>B12<br>B15<br>B18<br>B19<br>B22<br>B23<br>B24<br>B25 | C1<br>C3<br>C4<br>C6<br>C7<br>C8 |
| Adquirir ferramentas a través da Educación Matemática Crítica para emitir xuízos fundados desde unha perspectiva da Educación para o Desenvolvemento fomentando a construción dun cidadán global. | A38<br>A39<br>A40<br>A41<br>A42 | B2<br>B3<br>B8<br>B11<br>B12<br>B18                                                                          | C1<br>C3<br>C4<br>C6<br>C7<br>C8 |



| Contents                                                                             |                                                                                                                         |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Topic                                                                                | Sub-topic                                                                                                               |
| The mathematics and his relation with the culture and the society.                   | The mathematics in the culture.<br>The mathematics in the society.<br>The mathematics like tool for the sustainability. |
| The mathematics through the history.                                                 | The mathematics in the Prehistory, in the Ancient Age, in the Half Age, in the Modern Age and in the Contemporary Age.  |
| The education and the learning of the mathematics in the stage of Primary Education. | School curriculum.<br>Models of learning and education.<br>Development of school mathematical competitions.             |
| Resources and materials for the education of the mathematics.                        | Mathematical tasks.<br>Didactic material.                                                                               |
| The natural numbers. The systems of numbering.                                       | Development of the concept of number.<br>Systems of numbering.                                                          |
| The addition and the subtraction.                                                    | Initiation to the problems of calculation.<br>Additive and subtractive problems .<br>The algorithms.                    |
| The multiplication and the division.                                                 | Multiplicative and division problems.<br>Algorithms.<br>The calculator in the classroom.                                |

| Planning                        |                                                                                                                 |                      |                               |             |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------|-------------|
| Methodologies / tests           | Competencies                                                                                                    | Ordinary class hours | Student?s personal work hours | Total hours |
| Guest lecture / keynote speech  | A38                                                                                                             | 20.5                 | 31.5                          | 52          |
| Laboratory practice             | A38 A39 A40 A41<br>A42 B1 B2 B3 B4 B5<br>B8 B9 B11 B12 B15<br>B18 B19 C1 C3 C6<br>C7 C8                         | 21                   | 21                            | 42          |
| Mixed objective/subjective test | B2 B3 B4 B8 B9 C1                                                                                               | 2                    | 9                             | 11          |
| Workbook                        | A39 A41 A42 B1 B15<br>C7 C8                                                                                     | 0                    | 6                             | 6           |
| Oral presentation               | B3 B8 B9 B10 B11<br>B12 C1 C3                                                                                   | 0.5                  | 2.5                           | 3           |
| Multiple-choice questions       | A39 A42 B2 B4                                                                                                   | 1                    | 7                             | 8           |
| Critical bibliographical        | A39 A42 B1 B3 B4 B9<br>B15 B18 C1 C4                                                                            | 0                    | 2                             | 2           |
| Supervised projects             | A38 A39 A40 A41<br>A42 B1 B2 B3 B5 B9<br>B10 B11 B12 B15<br>B18 B19 B21 B22<br>B23 B24 B25 C1 C3<br>C4 C6 C7 C8 | 0                    | 23.5                          | 23.5        |
| Online forum                    | A41 B3 B4 B5 B8 B9<br>B12 B15 B18 B19<br>B22 C1 C3 C4 C6 C7                                                     | 0                    | 0.5                           | 0.5         |
| Personalized attention          |                                                                                                                 | 2                    | 0                             | 2           |

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



| Methodologies                   |                                                                                                                                                                                                                                                                     |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Methodologies                   | Description                                                                                                                                                                                                                                                         |
| Guest lecture / keynote speech  | Exhibition of the distinct subjects by part of the professors, looking for present the information and motivate the study and the work.                                                                                                                             |
| Laboratory practice             | Work in the classroom, in groups reduced, on concrete appearances of the different subjects, following scripts more or less open, and with the help of materials.                                                                                                   |
| Mixed objective/subjective test | Proof written (examination) where combine open and enclosed questions.<br>In principle it refers to the final examination of the matter, although it can have other lower proofs along the course.                                                                  |
| Workbook                        | Material writing that proposes to the students to know different questions of the temario.                                                                                                                                                                          |
| Oral presentation               | Exhibition in the classroom of the Project of investigation realised by each one of the groups.                                                                                                                                                                     |
| Multiple-choice questions       | Compulsory test for each one of the subjects, that will do when finalising the work in class of each one of the subjects of the course.<br>The dates for his realisation will communicate to the start of the course and will realise through the virtual platform. |
| Critical bibliographical        | Analysis of the mathematical contents and proposal of activities, on a book of appropriate reading for students of Primary Education.                                                                                                                               |
| Supervised projects             | Propoñeráse un traballo relacionado con algún ou algúns dos temas ou contidos da materia.                                                                                                                                                                           |
| Online forum                    | Participation in a social network of the matter, where each student will propose subjects and will comment the proposed by other students.                                                                                                                          |

| Personalized attention                                                                             |                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Methodologies                                                                                      | Description                                                                                                                                                                                                                                                                                                                           |
| Laboratory practice<br>Mixed objective/subjective test<br>Oral presentation<br>Supervised projects | The personalised attention describes around these methodologies like moments of face-to-face work with the professor by what asks a compulsory participation of the student.<br>The form and the moment in that they develop will indicate in relation to each activity along the course according to the plan of work of the matter. |

| Assessment                      |                                                                                                                 |                                                                                                                                                                                                                  |               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Methodologies                   | Competencies                                                                                                    | Description                                                                                                                                                                                                      | Qualification |
| Laboratory practice             | A38 A39 A40 A41<br>A42 B1 B2 B3 B4 B5<br>B8 B9 B11 B12 B15<br>B18 B19 C1 C3 C6<br>C7 C8                         | Will take into account the participation, the interest showed, the realisation reasoned of the tasks,...                                                                                                         | 20            |
| Mixed objective/subjective test | B2 B3 B4 B8 B9 C1                                                                                               | It will value the exhibition and argumentation realised in each one of the proofs.                                                                                                                               | 45            |
| Oral presentation               | B3 B8 B9 B10 B11<br>B12 C1 C3                                                                                   | It will value the clarity, skill to present the information and the communication of results and conclusions.                                                                                                    | 10            |
| Critical bibliographical        | A39 A42 B1 B3 B4 B9<br>B15 B18 C1 C4                                                                            | Each student has to choose a book of appropriate reading for a student of Primary Education and analyse his mathematical content and also propose activities dobre this book, to realise in the classroom.       | 5             |
| Supervised projects             | A38 A39 A40 A41<br>A42 B1 B2 B3 B5 B9<br>B10 B11 B12 B15<br>B18 B19 B21 B22<br>B23 B24 B25 C1 C3<br>C4 C6 C7 C8 | Valorarase o grado de consecución cumprindo as directrices docentes.<br><br>Este traballo pode optar a desenvolver un proxecto de Aprendizaxe e Servizo en función da dispoñibilidade das entidades conveniadas. | 20            |



## Assessment comments

## Sources of information

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic         | <p>- ().</p> <p>ALSINA, C. ? FORTUNY, J.M.(1994) "La matemática del consumidor" (Institut Català del Consum:Barcelona)</p> <p>ÁLVAREZ, A. (1995) "Uso de la calculadora en el aula"(carpeta E.S.O.) (Narcea:Madrid)ÁLVAREZ, A. (1996) "Actividades matemáticas con materiales didácticos" (carpeta para la E.S.O.) (Narcea:Madrid)ANTÓN, J.L. y otros (1994) "Taller de Matemáticas" (carpeta E.S.O.) (Narcea:Madrid)BAROODY, A.J. (1988) "El pensamiento matemático de los niños" (Vi-sor?MEC:Ma-drid)CALLEJO, M.L. (1994) "Un club matemático para la diversidad" (Narcea:Madrid)CASTELNUOVO, E. (1990) "Didáctica de la matemática moderna" (Trillas:Mexico) CASTRO, E. (ed.)(2001) "Didáctica de la Matemática en la Educación Primaria".(Síntesis: Madrid) CHAMORRO, Mª del CARMEN (coord.) (2003) Didáctica de las Matemáticas para Primaria .(Pearson: Madrid) CHAMOSO, JOSÉ; RAWSON, WILLIAM ( 2003 ) Matemáticas en una tarde de paseo ( Nivola: Madrid)CHEVALLARD, Yves - BOSCH, Marianna - GASCÓN, Josep(1997) "Estudiar Matemáticas. El eslabón perdido entre enseñanza y aprendizaje" (Horsori: Barcelona)COCKCROFT,W.H. (1985) "Las matemáticas sí cuentan" (M.E.C.: Madrid) COMAP ( 1999 ) Las matemáticas en la vida cotidiana ( Addison-Wesley:Madrid)CORBALÁN, F. (2002) "La matemática aplicada a la vida cotidiana" (Graó:Barcelona)DICKSON, L. ? BROWN, M. ? GIBSON, O. (1991) "El aprendizaje de las matemáticas" (Labor / M.E.C.:Madrid)FISHER, R. -VINCE, A. (1990) "Investigando las Matemáticas" 4 vol. (Akal:Madrid) GALLEGO LÁZARO, CARLOS... [et al.] (2005) Repensar el aprendizaje de las matemáticas Matemáticas para convivir comprendiendo el mundo ( Graó:Barcelona) GIMÉNEZ, JOAQUIM; SANTOS, LEONOR; DA PONTE,JOAO PEDRO (coords.) ( 2004 ) La actividad matemática en el aula Homenaje a Pablo Abrandes ( Graó: Barcelona)GODINO, JUAN D. (2003) ?Proyecto Edumat-Maestros. Matemáticas y su Didáctica para Maestros? URL: <a href="http://www.ugr.es/~jgodino/edumat-maestros/welcome.html">http://www.ugr.es/~jgodino/edumat-maestros/welcome.html</a> GÓMEZ CHACÓN, INÉS Mª; FIGUERAS OCAÑA, LOURDES; MARÍN RODRÍGUEZ, MARGARITA ( 2001 ) Matemáticas en la red: Internet en el aula de Secundaria ( Ministerio de Educación y Ciencia ? nancea: Madrid) GORGORIÓ, N.; DEOULOFEU, J.; BISHOP, A. (coords.) ( 2000) Matemáticas y educación Retos y cambios desde una perspectiva internacional / (Graó:ICE de la Universitat de Barcelona; Barcelona)LLINARES, S. - SÁNCHEZ, M.V. (1990) "Teoría y Práctica en Educación Matemática" (Alfar:Sevilla)MAZA, C. (1989) "Sumar y restar" (Visor:Madrid)MAZA, C. (1991) "Multiplicar y dividir" (Visor:Madrid)N.C.T.M. (2003) "Principios y Estándares para la educación matemática" (S.A.E.M. ?Thales?:Sevilla)ORTON, A.(1990) "Didáctica de las matemáticas" (Morata/M.E.C.: Madrid)UDINA IABELLÓ, F. (1989) "Aritmética y calculadoras" (Síntesis:Madrid) VELÁSQUEZ, FIDELA (coord.) (2004) Matemáticas en Internet ( Graó: Barcelona) Os libros da colección "Matemáticas:cultura y aprendizaje" de la editorial Síntesis.</p> |
| Complementary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## Recommendations

### Subjects that it is recommended to have taken before

### Subjects that are recommended to be taken simultaneously

### Subjects that continue the syllabus

Education in Mathematics II/652G02018

Education in Mathematics III/652G02024

Problem Solving in Mathematics/652G02030

## Other comments



O profesor puiden solicitar a entrega do traballo impreso, en cuxo caso recoméndase non utilizar plásticos, escoller a impresión a dobre cara e empregar papel reciclado e evitar imprimir borradores de uso propio.

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 sostenibilidade 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.**