



## Information about the subject

**Degree:** Bachelor of Arts Degree in Primary School Education

**Faculty:** Faculty of Teacher Training and Education Sciences

**Code:** 1160308 **Name:** Fundamentals of Geometry and Information Processing

**Credits:** 4,50 **ECTS** **Year:** 3 **Semester:** 1

**Module:** Teaching and learning of Mathematics

**Subject Matter:** Mathematics and its Didactics **Type:** Compulsory

**Field of knowledge:** Social and Legal Science

**Department:** Mathematics, Natural Sciences, and Social Sciences applied to Education

**Type of learning:** Classroom-based learning / Online

**Languages in which it is taught:** English, Spanish

**Lecturer/-s:**

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## Module organization

### Teaching and learning of Mathematics

Subject Matter	ECTS	Subject	ECTS	Year/semester
Mathematics and its Didactics	15,00	Fundamentals of Arithmetic and Measurement	4,50	1/2
		Fundamentals of Geometry and Information Processing	4,50	3/1
		Teaching of Mathematics	6,00	3/2



## Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

- R1 The student actively participates in the proposed tasks in class.
- R2 The student uses correct terminology and symbols specific to mathematics.
- R3 The student maintains a high degree of grammatical and spelling accuracy.
- R4 The student poses and solves geometric problems and data handling related to everyday life.
- R5 The student applies and demonstrates basic properties of geometric figures.
- R6 The student uses statistical techniques for data analysis.
- R7 The student values mathematics as a cultural fact.
- R8 The student provides clear and detailed oral and written descriptions and presentations, developing concrete ideas and concluding with appropriate conclusions, while maintaining a high degree of grammatical and spelling accuracy.



## Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

BASIC	Weighting			
	1	2	3	4
CB4 That students will be able to convey information, ideas, problems and solutions to both specialized and non-specialized audiences.				x
GENERAL	Weighting			
	1	2	3	4
CG1 Understand the curricular areas of Primary Education, the interdisciplinary relationship between them, the evaluation criteria, and the body of didactic knowledge around the respective teaching and learning procedures.			x	
CG2 Design, plan, and evaluate teaching and learning processes, both individually and in collaboration with other teachers and professionals from the school.			x	
CG6 Know the organization of primary education schools and the diversity of actions involved in their functioning. Perform tutoring and orientation with students and their families, addressing the singular educational needs of the students. Recognize that the exercise of the teaching function must go on improving and adapting to the scientific, pedagogical, and social changes throughout life.			x	
CG10 Reflect on classroom practices to innovate and improve teaching work. Acquire habits and skills for autonomous and cooperative learning and promote it among students.			x	
CG11 Know and apply information and communication technologies in the classrooms. Selectively discern audiovisual information that contributes to learning, civic education, and cultural enrichment.			x	
SPECIFIC	Weighting			
	1	2	3	4



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CE36 Acquire basic mathematical competencies (numerical, calculation, geometric, spatial representations, estimation, measurement, organization, and interpretation of information, etc.). X

CE37 Know the school curriculum of mathematics. X

CE38 Analyze, reason, and communicate mathematical proposals. X

CE39 Pose and solve problems linked to daily life. X

CE40 Value the relationship between mathematics and sciences as one of the pillars of scientific thinking. X

CE51 Develop and evaluate curriculum content using appropriate didactic resources and promote the corresponding competencies in students. X





## Assessment system for the acquisition of competencies and grading system

### In-class teaching

Assessed learning outcomes	Granted percentage	Assessment method
R2, R3, R4, R5, R6, R8	15,00%	Oral presentation of group and individual works: Self-assessment systems (oral, written, individual, in groups). Oral tests (individual, in groups, presentation of topics or works).
	0,00%	Monitoring of student work in non-face-to-face/distance sessions: Observation techniques, rubrics, checklists. Portfolios.
	0,00%	Active participation in theoretical-practical sessions, seminars, and tutorials: Attitude scale (to gather opinions, values, social and managerial skills, interaction behaviors).
R2, R3, R4, R5, R6, R8	60,00%	Written tests: Objective tests with short and extended responses.
R1, R2, R3, R4, R5, R6, R7, R8	25,00%	Projects. Development and/or design works.

### Observations

The exam will consist of a written test of between 5 and 8 questions with subsections, among which there will be exercises, problems and theoretical questions. In all cases, the answers must be duly justified.

The section "Projects. Development and/or design work" will be evaluated by carrying out practices or questionnaires, both group and individual.

It is an essential, but not sufficient, requirement to pass the subject to pass the exam.

It is an essential requirement to pass the subject that the student does not make more than 3 spelling mistakes in each written test (both assignments and practices as well as theoretical-practical exam).

Notes of the approved parts of one course will not be saved for another.

The delivery of the works and practices must be done in a timely manner within the periods established by the teacher of the subject.

### **SINGLE ASSESSMENT**

Exceptionally, students who cannot participate in the continuous assessment system due to not attending at least 70% of classes may opt for this assessment system. In this case, they will be assessed as follows:



· Exam, whose percentage of the final grade will be 85% - Assessed learning outcomes: R2, R3, R4, R5, R6, R8

· Oral presentation, whose percentage of the final grade will be 15% - Assessed learning outcomes: R1, R2, R3, R4, R5, R6, R7, R8

### **ARTIFICIAL INTELLIGENCE**

Students may use AI for personal study of the subject.

Students may not use AI to complete assessable tasks, unless required for a specific activity and the teacher so indicates.

If AI is used in any of the activities, it must be stated in which part of the activity it has been used, which AI tool has been used and for what purpose.

### **Online teaching**

Assessed learning outcomes	Granted percentage	Assessment method
R2, R3, R4, R5, R6, R8	60,00%	Written tests: short-answer objective tests, developmental tests. Projects. Reports/Practical reports. Design work, development
R2, R3, R4, R5, R6, R8	15,00%	Exposición oral de trabajos grupales e individuales: sistemas de autoevaluación (oral, escrita, individual, en grupo). Pruebas orales (individual, en grupo, presentación de temas-trabajos)
	0,00%	Monitoring of student work in non-face-to-face/distance sessions: Observation techniques, rubrics, checklists. Portfolios.
	0,00%	Active participation in theoretical-practical sessions, seminars, and tutorials: Attitude scale (to gather opinions, values, social and managerial skills, interaction behaviors).
R1, R2, R3, R4, R5, R6, R7, R8	25,00%	Projects. Development and/or design works.

### **Observations**

The exam will consist of a written test of between 5 and 8 questions with subsections, among which there will be exercises, problems and theoretical questions. In all cases, the answers must be duly justified.

The section "Projects. Development and/or design work" will be evaluated by carrying out practices or questionnaires, both group and individual.

It is an essential, but not sufficient, requirement to pass the subject to pass the exam.

It is an essential requirement to pass the subject that the student does not make more than 3 spelling mistakes in each written test (both assignments and practices as well as theoretical-practical exam).



Notes of the approved parts of one course will not be saved for another.

The delivery of the works and practices must be done in a timely manner within the periods established by the teacher of the subject.

### **ARTIFICIAL INTELLIGENCE**

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If AI is used in any of the activities, it must be stated in which part of the activity it has been used, which AI tool has been used and for what purpose.

### **CRITERIA FOR THE AWARDING OF HONOURS:**

In accordance with the regulations governing the assessment and grading of subjects in force at UCV, the distinction of "Matrícula de Honor" (Honours with Distinction) may be awarded to students who have achieved a grade of 9.0 or higher. The number of "Matrículas de Honor" (Honours with Distinction) may not exceed five percent of the students enrolled in the group for the corresponding academic year, unless the number of enrolled students is fewer than 20, in which case a single "Matrícula de Honor" (Honours with 9 Distinction) may be awarded. Exceptionally, these distinctions may be assigned globally across different groups of the same subject. Nevertheless, the total number of distinctions awarded will be the same as if they were assigned by group, but they may be distributed among all students based on a common criterion, regardless of the group to which they belong. The criteria for awarding "Matrícula de Honor" (Honours with Distinction) will be determined according to the guidelines stipulated by the professor responsible for the course, as detailed in the "Observations" section of the evaluation system in the course guide.

## **Learning activities**

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

M1      Participatory Master Class

M2      Case Study

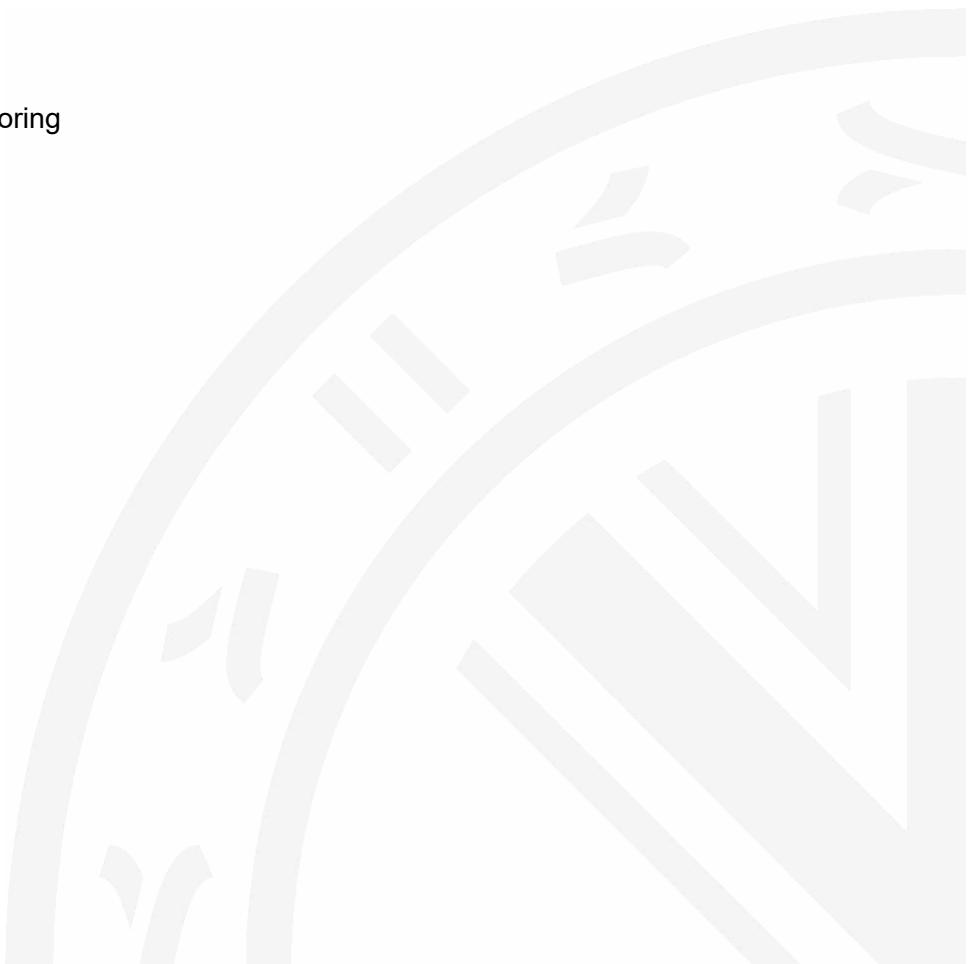
M5      Seminar Work

M6      Problem-based Learning

M7      Cooperative/Collaborative Work



- M9      Group and Individual Tutoring
- M10     Individual Tutoring
- M11     Participatory Master Class
- M12     Case Study
- M13     Seminar Work
- M17     Problem-based Learning
- M18     Cooperative/Collaborative Work
- M19     Individual Tutoring
- M20     Group and Individual Tutoring





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## IN-CLASS LEARNING

### IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Group Work Presentation M7	R1, R2, R3, R4, R5, R6, R8	3,00	0,12
Theoretical Class M1	R1, R2, R3, R4, R5, R6, R7	22,50	0,90
Practical Class M6, M7, M9	R1, R2, R3, R4, R5, R6, R7	12,00	0,48
Tutoring M10	R2, R3, R5, R6, R8	4,75	0,19
Evaluation M2, M6	R2, R3, R4, R5, R6, R8	2,75	0,11
<b>TOTAL</b>		<b>45,00</b>	<b>1,80</b>

### LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Group work M7	R2, R3, R4, R5, R6, R7, R8	17,00	0,68
Individual work M2, M6	R2, R3, R4, R5, R6, R7	50,50	2,02
<b>TOTAL</b>		<b>67,50</b>	<b>2,70</b>



## ON-LINE LEARNING

### SYNCHRONOUS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Theoretical class (e-learning mode) M11	R1, R2, R3, R4, R5, R6, R7	22,00	0,88
Practical class (e-learning mode) M17, M18, M20	R1, R2, R3, R4, R5, R6, R7, R8	12,00	0,48
Individual tutoring (e-learning mode) M19	R2, R3, R5, R6, R8	3,00	0,12
Evaluation (e-learning mode) M12, M17	R2, R3, R4, R5, R6, R8	4,00	0,16
<b>TOTAL</b>		<b>41,00</b>	<b>1,64</b>

### ASYNCHRONOUS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Individual work Activities (e-learning mode) M12, M17	R2, R3, R4, R5, R6, R7	56,50	2,26
Group Work (e-learning mode) M18	R2, R3, R4, R5, R6, R7, R8	9,75	0,39
Discussion Forums (e-learning mode) M18	R2, R3, R4, R5, R6, R7, R8	0,25	0,01
Asynchronous Tutoring (e-learning mode) M19	R2, R3, R4, R5, R6, R8	1,00	0,04
Theoretical-Practical Class (distance mode) M11, M12, M17	R1, R2, R3, R4, R5, R6, R7, R8	4,00	0,16
<b>TOTAL</b>		<b>71,50</b>	<b>2,86</b>



## Description of the contents

Description of the necessary contents to acquire the learning outcomes.

### Theoretical contents:

Content block	Contents
Plane geometry	<ul style="list-style-type: none"><li>· Basic concepts.</li><li>· Classification of plane figures.</li><li>· Likeness. Metric relations of the triangle.</li><li>· Movements in the plane.</li><li>· Lengths and areas.</li></ul>
Spatial geometry	<ul style="list-style-type: none"><li>· Polyhedra. Basic concepts. Classification.</li><li>· Solids of revolution.</li><li>· Surface development. Volume.</li></ul>
Statistics	<ul style="list-style-type: none"><li>· Basic concepts.</li><li>· Statistical measures.</li><li>· Graphic representation.</li></ul>
Probability	<ul style="list-style-type: none"><li>· Basic concepts.</li><li>· Laplace's rule.</li></ul>



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Temporary organization of learning:

Block of content	Number of sessions	Hours
Plane geometry	11,00	22,00
Spatial geometry	5,50	11,00
Statistics	4,00	8,00
Probability	2,00	4,00



## References

Alsina i Pastells, A. (2004). *Desarrollo de competencias matemáticas con recursos lúdicos-manipulativos*. Para niños y niñas de 6 a 12 años. Narcea.

Callejo, Mª L. (1994). *Un club matemático para la diversidad*. Narcea.

Cascallana, M. T. (1988). *Iniciación a la matemática*. Materiales y recursos didácticos. Ed. Aula XXI / Santillana.

Castro, E. (2001). *Didáctica de la matemática en la Educación Primaria*. Madrid: Síntesis.

Chamorro, M. C. (2003). *Didáctica de las Matemáticas para Primaria*. Prentice Hall.

Chauvel, D., Michel, V. (1989). *Juegos de reglas para desarrollar la inteligencia*. Nancea.

Colección (1991). *Matemáticas: Cultura y aprendizaje*. Madrid: Síntesis.

Corbalán, F. (1996). *Números, cultura y juegos. Tu mundo y las matemáticas*. Videocinco, Madrid.

De Guzmán, M. (2004). *Para pensar mejor*. Ediciones Pirámide (Grupo Anaya S.A.). Ferrero, L. (1991). *El juego y la matemática*. La Muralla. Madrid.

Godino, J. D. (2004) *Matemáticas para maestros*. Dpto. Didáctica de las Matemáticas, Univ. Granada.

Gómez-Chacón, I.Mª. (1992). *Los juegos de estrategia en el currículo de Matemáticas*. Narcea.

Gutiérrez, A. (1991). *Matemáticas: Cultura y aprendizaje*. Madrid: Síntesis.

Hidalgo-Alonso, S. (1997). *Las matemáticas en el título de maestro*. Consideraciones teóricas, didácticas y prácticas. L. Diagonal.

Martínez, J., Bujanda, M.P., Velloso, J.M. (1984). *Matemáticas 1*, Ediciones SM.

Miranda-Casas, A. (1988). *Dificultades del aprendizaje de las matemáticas*. Un enfoque evolutivo. Aljibe.

Nortes-Checa, A. (1993). *Matemáticas y su didáctica*. Tema-DM.

Nortes-Checa, A. (2013). *Actividades prácticas de Matemáticas y su didáctica 1*. EDITORIAL CCS.

Nortes-Checa, A. (2014). *Actividades prácticas de Matemáticas y su didáctica 2*. EDITORIAL CCS.

Nortes-Checa, A., Nortes-Martínez-Artero, R. (2012). *La resolución de problemas de Geometría*. EDITORIAL CCS.