Universitat de Lleida

DEGREE CURRICULUM

SPACE AND FORM

Coordination: VANEGAS MUÑOZ, YULY MARSELA

Academic year 2021-22

SPACE AND FORM 2021-22

Subject's general information

<table>
<tr><td>Subject name</td><td>SPACE AND FORM</td></tr>
<tr><td>Code</td><td>100986</td></tr>
<tr><td>Semester</td><td>1st Q(SEMESTER) CONTINUED EVALUATION</td></tr>
<tr><td>Typology</td><td>
<table>
<tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr>
<tr><td>Bachelor's Degree in Primary Training</td><td>2</td><td>COMPULSORY</td><td>Attendance-based</td></tr>
<tr><td>Double bachelor's degree: Degree in Pre-school Education and Degree in Primary Training</td><td>2</td><td>COMPULSORY</td><td>Attendance-based</td></tr>
<tr><td>Double bachelor's degree: Degree in Primary Training and Degree in Physical Activity and Sports Sciences</td><td>3</td><td>COMPULSORY</td><td>Attendance-based</td></tr>
</table>
</td></tr>
<tr><td>Course number of credits (ECTS)</td><td>6</td></tr>
<tr><td>Type of activity, credits, and groups</td><td>
<table>
<tr><th>Activity type</th><td>PRAULA</td><td>TEORIA</td></tr>
<tr><th>Number of credits</th><td>1.8</td><td>4.2</td></tr>
<tr><th>Number of groups</th><td>5</td><td>5</td></tr>
</table>
</td></tr>
<tr><td>Coordination</td><td>VANEGAS MUÑOZ, YULY MARSELA</td></tr>
<tr><td>Department</td><td>MATHEMATICS</td></tr>
<tr><td>Teaching load distribution between lectures and independent student work</td><td>Each enrolled credit requires a dedication of 25 hours on the part of the student. Of these 25 hours, 10 are given in the classroom and the remaining 15 must be dedicated by the student to independent work outside of class.

The autonomous work teachers dedicated to the study of the contents worked on in class; to doing the proposed activities, problems and assignments and to reading recommended documents.

The didactic sequence/geometric workshop will also be carried out within the hours of autonomous work.</td></tr>
<tr><td>Important information on data processing</td><td>Consult this link for more information.</td></tr>
<tr><td>Language</td><td>Catalan, Spanish</td></tr>
</table>

SPACE AND FORM 2021-22

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
RICART ARANDA, MARIA	maria.ricartaranda@udl.cat	6	
VANEGAS MUÑOZ, YULY MARSELA	yuly.vanegas@udl.cat	18	
ZANUY RUFAS, RAQUEL	raquel.zanuy@udl.cat	6	

Learning objectives

The subject focuses on the basic notions of school geometry that need to be worked on in primary education and on the way in which the mathematics class should be managed in order to favour the development of competences.

In this sense, the objectives of the subject are as follows:

- To know the contents and curricular orientations of space and form.
- To know, value and use mathematical and didactic aspects of geometry.
- To pose and solve problems of space and shape related to everyday life and other contexts.
- Know, analyse, propose and evaluate school proposals that favour the development of a competent geometric activity.
- Effectively approach the reading and critical commentary of texts related to the teaching-learning of geometry.
- Manage appropriate information and use it in the design and evaluation of school proposals for the teaching and learning of geometry.
- Critically incorporate innovations and educational technology in the primary education classroom.
- Cooperatively solve content study and school learning tasks.

Competences

- Possess and understand knowledge in an area of study - Education - which starts from the basis of general secondary education, and is usually at a level which, while relying on advanced textbooks, also includes some aspects involving knowledge from the cutting edge of their field of study.
- Gather and interpret relevant data (normally within their area of study) in order to make judgements that include a reflection on relevant social, scientific or ethical issues.
- Know the intercultural reality and develop attitudes of respect, tolerance and solidarity towards different social and cultural groups.
- To be aware of the right to equal treatment and opportunities between women and men, in particular through the elimination of discrimination against women, whatever their circumstances or condition, in any sphere of life.
- Assume a commitment to personal and professional development with oneself and the community. Adapt learning proposals to the most significant cultural evolutions.
- Know the curricular areas of Primary Education, the interdisciplinary relationship between them, the assessment criteria and the body of didactic knowledge about the respective teaching and learning

procedures.
- Design, plan and evaluate teaching and learning processes, both individually and in collaboration with other teachers and professionals at the centre.
- Apply essential notions of scientific thinking.
- To be aware of the measures that guarantee and make effective the right to equal opportunities for people with disabilities.

Subject contents

- Development of **geometric thinking in primary education**
- The **Primary School curriculum**: objectives, competences and content (space and shape and measurement).
- The **processes of geometric activity** (visualisation, composition and decomposition, representation, classification, definition, reasoning).
- Management and planning of proposals that promote a **geometric activity of competence**.
- Learning geometry in Primary Education. **Central ideas** Space and shape and Measurement:
- Description and representation of space (basic elements of the geometry of space, solids; areas and volumes of space).
- Shapes and measurements (plan covering, perimeter and area).
- Geometric transformations (symmetries; translations and rotations) Mosaics.

Methodology

Face-to-face and virtual activity

- The face-to-face and virtual activity will combine the teacher's explanations with the students' participation by solving the questions, activities or problems posed by the teacher.
- Practice with resources and manipulative materials.
- The face-to-face and virtual activity requires a proactive attitude from the students.

Autonomous student work

- Each enrolled credit requires a **dedication of 25 hours by the student**. Of these 25 hours, **10 are carried out face-to-face in the classroom** and the remaining **15 must be dedicated by the student to work autonomously** apart from the classes.
- The hours of autonomous work must be devoted to deepen the contents worked in class and do the activities, problems and proposed works.
- The didactic sequence and/or geometric workshop will also be carried out within the hours of autonomous work.

Note: The teaching methodology and the evaluation of proposals may undergo some modification depending on the restrictions imposed by the health authorities.

Development plan

Indicative planning of classroom sessions

Weeks	Description
1-3	Reflections on geometry as a model The mathematics laboratory
4-5	Repetition and classifications. Shapes and movements Research and selection of contexts for planning school geometric activities.
6-7	Reasoning and construction. Levels of reasoning

8-9	Representation and visualization Design of school geometric activities
10	Measurement as a social construction Learning trajectories
11-12	Geometrical transformations
13-14	Geometric communication Analysis of the management of the implementation of school activities

Evaluation

- Learning activities
- Carrying out, discussing and communicating the proposed practices.
- Participation in class discussions and group practical work.

Each evaluation evidence has dates of delivery that will be defined in the presentation of the subject depending on the schedules and calendar of each group.

Some of the evaluation evidences will be carried out during class time (face-to-face - virtual) therefore it is advisable to follow the course constantly.

Specifications for Bilingual, DIP and CAFE groups

Assessment Activity	%	Term	Typology	Minimum grade for weighting
Practical activities. Group work throughout the course. (E1)	30%	1st	Compulsory	5 (Attendance at all practice sessions)
Planning and design of school proposals (didactic sequence/geometric workshop). Work in pairs (E2)	20%	1st	Compulsory	5
Individual test (face-to-face) (E3)	50%	1st	Compulsory	4.5

Specifications for DUAL groups (Morning - Afternoon)

Assessment Activity	%	Term	Typology	Minimum grade for weighting
Practical activities. Group work throughout the course. (E1)	20%	1st	Compulsory	5 (Attendance at all practice sessions)
Planning, design and implementation of school proposals (didactic sequence/ geometric workshop) and reflection on the practice. Work in pairs. (E2)	30%	1st	Compulsory	5
Individual test (face-to-face) (E3)	50%	1st	Compulsory	4.5

In January there will be a second-chance examination for those who have failed the individual test. The final mark for those who obtain a mark of more than 5 in the second-chance test will not exceed in any case 5.

In order to pass the subject, the overall mark, calculated according to the specified weightings, must be equal to or higher than 5 out of 10.

Final grade of the subject: 0,3*E1 + 0,2*E2 + 0.5*E3 (Bilingual, DIP, CAFE groups)

Final grade of the course: 0,2*E1 + 0,3*E2 + 0,5*E3 (DUAL Groups Morning - Afternoon)

Not presented: Students who only take assessment tests that add up to less than 50% of the final mark for the course will be graded as "Not presented".

Repeat students must take the course in the same way as the rest of the students. If they have problems of timetable incompatibility, they should consider the possibility of requesting another form of assessment, provided that the required conditions are met.

ALTERNATIVE ASSESSMENT

Students who complete the alternative assessment requirements must individually carry out the same activities as students in continuous assessment. The weighting criteria are those established for each activity. The dates of delivery and the assessment criteria are the same as those applied to students in continuous assessment. These dates will be defined for each group in the presentation of the course.

Bibliography

Basic bibliography

Albarracin, L.; Badillo, E.; Giménez, J.; Vanegas, Y.; Vilella, X. (2018). Aprender a ensenyar matemáticas en la educación primaria. Madrid: Síntesis
Alsina, C.; Burgués, C.; Fortuny, J. M. (1987). Invitación a la didáctica de la geometría. Madrid: Síntesis.
Alsina, C.; Burgués, C.; Fortuny, J. M. (1987). Materiales para construir la geometría. Madrid: Síntesis.
Alsina, C.; Burgués, C.; Fortuny, J. M. (1995). Ensenyar matemàtiques. Barcelona: Graó.
Alsina, C.; Pérez, R.; Ruiz, C. (1988). Simetría dinámica. Madrid: Síntesis.
Burgués, C. (1992). Endavant amb la geometría. A: L'Educació Primària. Exemples d'unitats de programació 2. Barcelona: Departament d'Ensenyament G.C.
Cañizares, M. J. (2001). Elementos geométricos y formas espaciales. A: E. Castro (ed.),
Carrillo, J.; Contreras, L. C. (2001). Transformaciones geométricas. A: E. Castro (ed.),
Castelnuovo, E. (1981). La geometría. Barcelona: Ketres.
Chamorro, C. (2003) Didáctica de las Matemáticas. Madrid: Pearson Educación.
Díaz Godino, J.; Ruiz, F. (2002). Geometría y su didáctica para maestros. Granada: Dep. de Didáctica de la Matemática, Universidad de Granada.
Fiol, M. L.; Fortuna, J. M. (1990) Proporcionalidad directa: la forma y el número. Madrid: Síntesis.
Grupo Beta (1990). Proporcionalidad geométrica y semejanza. Madrid: Síntesis.
Jaime, A.; Gutiérez, A. (1996). El grupo de las isometrías del plano. Madrid: Síntesis.
Martínez, A. M.; Juan, F. R. (coord.) (1989). Una metodología activa y lúdica para la enseñanza de la geometría. Madrid: Síntesis.
NCTM (1991). Estándares curriculares y de evaluación para la educación matemática. Sevilla: SAEM. Thales.
Olmo, M. A. del (1989). Superficie y volumen: ¿algo más que el trabajo con fórmulas? Madrid: Síntesis.
Rubio , A., Vanegas , Y., Prat , M. (2019). Herramienta para evaluar trayectorias de aprendizaje de la medida delongitud en niños de 6-8 años. Edma 0-6: Educación Matemática en la Infancia, 7(2), 76-86.
Serrano, L. (2001). Elementos geométricos y formas planas. A: E. Castro (ed.), Didáctica de la matemática en la educación primaria (p. 379-400). Madrid: Síntesis.
Vanegas, Y., Prat, M., Giménez, J. (2021). Los retos de la formación a distancia en Educación Primaria. ¿Cómo gestionar la clase de matemáticas? En Aula virtual o cómo plantear las clases a distancia y no morir en el intento. Cuadernos de Pedagogía. Wolters Kluwer.

Additional bibliography

Alsina, C. (2005). Geometría cotidiana. Barcelona: Rubes.
Alsina, C.; Fortuna, J. M.; Pérez, R. (1997). ¿Por qué geometría?: propuestas didácticas para la ESO. Madrid: Síntesis.
Alsina, C.; Fortuny, J. M. (1992). Miralandia. Un viaje geométrico al país de los espejos. Granada: Proyecto Sur.
Autors diversos (2002). Geometría en todos los niveles y según nivel. Revista UNO, núm. 2.

Autors diversos (2006). La geometría, una enseñanza imprescindible. Revista UNO, núm. 42.
Corbalán, F. (1995). La matemática aplicada a la vida cotidiana. Barcelona: Graó.
De Guzman, M. (2006). Para pensar mejor: desarrollo de la creatividad a través de los procesos matemáticos. Pirámide
Domínguez, M. (1999). El número de oro. Granada: Proyecto Sur.
Mora,J. A.; Rodrigo, J. (1993). Mosaicos. Granada: Proyecto Sur.
Padilla, F. et al. (1991). Circulando por el círculo. Madrid: Síntesis.

Official documents

Generalitat de Catalunya (2017). Currículum educació primària (competències bàsiques). https://agora.xtec.cat/ceiparturmartorell/wp-content/uploads/usu99/2016/04/curriculum-educacio-primaria.pdf

Idees centrals matemàtiques (2019). https://sites.google.com/xtec.cat/idees-centrals-matematiques-ip/inici

Estàndards comuns per a les Matemàtiques (2018). https://agora.xtec.cat/cesire/wpcontent/uploads/usu397/2019/01/CCSSI_Math-Standards_CA_REV.pdf

Competències bàsiques de l'àmbit matemàtic. Educació primària (2013). http://ateneu.xtec.cat/wikiform/wikiexport/_media/materials/sfec/competencies_mates_primaria.pdf

Sites of interest

https://agora.xtec.cat/cesire/ambit-matematic/

http://divulgamat.ehu.es/

http://www.fi.uu.nl/en/cat/

https://union.fespm.es/index.php/UNION

http://www.mathsnet.net/dynamic/cindy/index.html

https://nrich.maths.org/

http://www.nucleogestion.8m.com/HALL.HTM

http://puntmat.blogspot.com/search/label/Espai%20i%20Forma

http://www.sinewton.org/numeros/

https://revistasuma.fespm.es/

http://www.uco.es/~ma1marea/alumnos/primaria/indice.html

http://www.unex.es/tcorco

https://venxmas.fespm.es/index.php/category/estemascatemeseugaiakgltemas/

http://www.xtec.cat/recursos/mates/index.htm

http://www.xtec.es/~jjareno/

http://www.xtec.es/recursos/clic/esp/act/mates/

http://www.xtec.net/~smargeli

https://sites.google.com/a/escolapovill.net/6e-de-primaria/matematiques/espai-i-forma/jocs-espai-i-forma