Universitat Autònoma de Barcelona

2018/2019

Connections and Contexts in Mathematics

Code: 102060
ECTS Credits: 6

Degree	Type	Year	Semester
2500798 Primary Education	OT	4	0

Contact

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Use of languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Teachers

Kaouthar Boukafri Itahriouan

Prerequisites

It is suggested that students who enroll in this course have taken and passed the subjects of the degree of Prima

" Matemàtiques per mestres " first year ,
" Aprenentatge de les matemàtiques i curriculum " seond year and
" Gestió i innovació a l'aula de matemàtiques " third year .

Objectives and Contextualisation

With the white light, Isaac Newton, he devised a plan to make it pass through a prism of glass revealed a beautiful rainbow that left astonished the experts of the Royal Society. This generated a direct question; white light is composed of all colors or was it the prism which colored it light? No more complexity than passing the multicolored light with an identical prism reversed the effect, returning to the vision of white light. This process was a bit more complex, but resolved the doubt.

In the same way that Sir Isaac, we spend many mathematical concepts through the prism of the education system, breaking it into different subjects. Instead, our students are not as demanding as the Royal Society and the first experiment have enough. The teachers expect students to be able to conclude the second prism but sometimes it not happens. Reality shows us that it is not an easy task and it is necessary to generate learning opportunities to develop.

In this course we learn to identify opportunities for learning in different contexts that lead us to practice using the second prism, connecting different subjects to work mathematical concepts more broadly.

To do this we will focus on practical models used in the classrooms of innovative schools: project work and work by corners, while developing the necessary evaluation tools.

So we learn to use tools to redirect this rainbow of material to a second prism, the interdisciplinary work.

OBJECTIVES:

- Identify, seize and create opportunities for learning mathematics in everyday situations or associated with other materials.
- Find, detect and connect activities, giving competence and interdisciplinary
- Analyze, design and create learning cooperative and interdisciplinary activities.
- Know, contextualize and practice activities connectorcharacter as work by corners or project work.
- Analyze, design and develop assessment tools for forming and competence activities.
- Guarantee a gender perspective and inclusive in the didactic productions.

Skills

- Critically analyse personal work and use resources for professional development.
- Design and regulate learning spaces in contexts of diversity that take into account gender equality, equity and respect for human rights and observe the values of public education.
- Design, plan and evaluate education and learning processes, both individually and in collaboration with other teachers and professionals at the centre.
- Develop autonomous learning strategies.
- Incorporate information and communications technology to learn, communicate and share in educational contexts.
- Know the curricular areas of Primary Education, the interdisciplinary relation between them, the evaluation criteria and the body of didactic knowledge regarding the respective procedures of education and learning.
- Maintain a critical and autonomous relationship with respect to knowledge, values and public, social and private institutions.
- Value the relationship between mathematics and sciences as one of the pillars of scientific thought.

Learning outcomes

1. Analyse the goals of mathematics education at different stages of primary education.
2. Design teaching / learning strategies in which the assumptions of personal decisions are prioritized, and the identification of relevant information for individual projects.
3. Design teaching and learning sequences that connect different mathematical topics.
4. Identifying, designing and communicating concepts, facts and phenomena of different sciences capable of being modelled using mathematical concepts.
5. Using virtual platforms as a communication and management tool for directed and supervised activities.

Content

Introduction

The nose of teachers, detecting learning opportunities

Incompetent activities?

From Reproduction to production

Separate and unify knowledge:

- Disciplinar : separated
- Multidisciplinar : together
- Interdisciplinar : mixed
- Transdisciplinar : Fusion

From small group work to work by corners

- Cooperative work
- Project work
- Work by corners

How to evaluate the cooperative work?

- The evolution of the evaluation
- Autoavaluation and Coevaluation
- Rubriks

Connect: Network

Connecting with the territory

- Interscholastic activities
- Intercommunal activities

Methodology

The protagonist in the educational process is the student and it is on this premise that has been planned methodology of the subject.As this is an optional subject , all the sessions will be done with the whole group class .

Still , as indicated in the methodology , there will be sessions where a small job in the classroom under the supervision of the teacher will be performed.

Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed			
Exhibitions by the teacher (BG)	20	0.8	1, 4, 5
Type: Supervised			
Workshop analysis of didactic proposals (SG)	30	1.2	2, 3
Workshop creation of didactic proposals (SG)	30	1.2	2, 3
Type: Autonomous			
Project (BG)	20	0.8	1, 2, 3, 4

Evaluation

The evaluation of the course will take place throughout the academic year through activities shown in the table.

Video 1 Begins:17/9 Delivery:8/10 Evaluation:Video-project creation

Group rubrik Begins:8/10 Delivery:15/10 Evaluation:Rubrik creation

Learn Oportun. Begins:15/10 Delivery:29/10 Evaluation:Project

Project Begins:29/10 Delivery 3/12 Evaluation:Project

Project rubrik Begins:29/10 Delivery:26/11 Evaluation:Rubrik creation

Microproj.1 Begins:26/11 Delivery:10/12 Evaluation:Microproj. creation

Microproj.2 Begins:3/12 Delivery:10/12 Evaluation:Microproj. creation

Video 2 Begins:10/12 Delivery:17/12 Evaluation:Video-project creation

To do arithmetic with other notes of the course, a minimum grade of these should be 5 in each one. Is not possible to recover tasks.

The student must take into account the assessment in policy considerations in the document: "Criteris i pautes generals d'avaluació de la Facultat de Ciències de l'Educació" (http://www.uab.cat/web/informacio- academic / AVALUACIO / rules-1292571269103.html)

As well as:

- Attendance at the contact sessions of this course is mandatory. It must be assisted to 80% of the face to be assessed hours.

- The note of group work is not necessarily the individual score of students in the group.

- The total or partial plagiarism of one of the activities and / or copy an assessment test is a direct reason for suspense of the subject.

- The marks obtained in each of the evaluation activities will be delivered to students within 15 days of its completion. Once delivered to the student may review and consultation on the schedule set by the teacher.

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Microproyect creation	30%	20	0.8	2, 3
Projects	30%	20	0.8	1, 2, 3, 4
Rubrik creation	10%	5	0.2	1, 4
Video-proyect creation	30%	5	0.2	3, 5

Bibliography

Alsina, C. (1998): Mathematics and Cross-Curricular Activities. Bridges Exist for Crossing them A: ZDM vol.30(2), p.34-36

Corbalán, F. (2007). Matemáticas de la vida misma. Barcelona: Graó.

Gallego Lázaro, C. (2005). Repensar el aprendizaje de las matemáticas :Matemáticas para convivir comprendiendo el mundo. Barcelona: Graó.

Greeno, J. (1992): Mathematical and Scientific Thinking in Classrooms and Other Situations. A:Enhancing Thinking Skills in the Sciences and Mathematics, p.39-63

Michelsen,C., Glargaard, N. I Dejgaard, J. (2005): Interdisciplinary Competences-Integrating mathematics and subjects of natural sciences. In M. Anaya, C.

Michelsen i B. Sriraman (Ed.)*Proceedings of the 1st International Symposium of Mathematics and its Connections to the Arts ans Sciences.* p 201-214

Christiansen, I. M. (1998): Cross-Curricular Activities Within One Subject? Modeling Ozone Depletion in 12th Grade. A: ZDM vol.30(2), p.22-27

Hughes-Hallett, D. (1998): Interdisciplinary Activities in Mathematics and Science in the United States. A: ZDM vol.30(4), p 116-118

Jorba, J.; Sanmartí, N. (1994). Enseñar, aprender y evaluar: un proceso de regulación continua. Madrid: Centro de Investigación y Documentación Educativa

Lave, J., & Wenger, E. (1998). Communities of Practice: Learning, Meaning, and Identity: Cambridge University Press.

Sanmartí, N. (2007). 10 ideas clave. Evaluar para aprender. Barcelona: Graó

Currículum Vigent a Catalunya: Decret 142/2008 - DOGC núm. 5183 i Decret 143/2007 DOGC núm. 4915. Accés via web a:

http://phobos.xtec.cat/edubib/intranet/index.php?module=P%E0gines&func=display&pageid=22