

Academic Year/course: 2022/23

## 63223 - Instructional and Curricular Design in Mathematics

### Syllabus Information

**Academic Year:** 2022/23

**Subject:** 63223 - Instructional and Curricular Design in Mathematics

**Faculty / School:** 107 - Facultad de Educación

**Degree:** 584 -

593 -

**ECTS:** 6.0

**Year:** 1

**Semester:** First semester

**Subject Type:** Optional

**Module:**

### 1. General information

### 2. Learning goals

### 3. Assessment (1st and 2nd call)

### 4. Methodology, learning tasks, syllabus and resources

#### 4.1. Methodological overview

The future teaching professional must develop a didactic action focused on problem solving and on the interaction of the student with its material and social environment. Therefore, the teaching offered in this subject is based on the same principles. In general, the master class will not have the traditional function of sequential presentation of contents, but will serve to anchor the contents, both mathematical and didactic, which have previously appeared in the practical classes, around the tasks of problem solving, case studies, etc.

Therefore, the learning process that has been designed for this subject is based on the following:

1. The use of a practical and collaborative teaching methodology, in which small group analysis and debate play a very important role, allowing the Secondary Education teacher in training to analyze, assess, use and contrast with their own experience the contents taught by the teacher.
2. The development of the contents that appear in the program.

#### 4.2. Learning tasks

This course presents different methodological strategies to develop the assigned competences and to achieve the learning objectives. The methodology followed in this course include: lectures, active learning methodologies, group or individual assignments, oral presentation and discussion of projects and tutorials.

**Practice sessions** (active learning methodologies and group assignments).

In the practical sessions, students will solve problematic situations, questions, cases... manipulating different didactic materials, in order to answer the questions that are raised in the script of practices. These activities will be both mathematical and didactic in nature. To answer the questions, it will be necessary to construct new concepts, and deeply review those already known. They will be held in the classroom and will require participants' presence. The scripts will be delivered at the end of the session and will therefore have their weight in the final grade (**Assessment task b1**)

### **Theory sessions.**

In these sessions, the teacher will explain theoretical contents with a more interactive and participative character than the master class.

### **Problem and case study sessions** (individual assignments).

In some theoretical sessions, students will be proposed to solve problems of mathematical and/or didactic content. Some of them will be solved in class, while others will be handed in and will therefore have their weight in the continuous evaluation grade (**Assessment task b2**).

### **Project** (tutorial, oral presentation and discussion of projects).

A part of the assessment of the subject will be an individual assignment. Previously arranged seminars will be held to detail the work to be done, to supervise its progress and to evaluate the participation of each one of the team members.

During the theory sessions, students will receive instructions to carry out an individual assignment (**Assessment task c**). Additionally, Previously arranged seminars will be held to detail the work to be done and to supervise its progress. Finally, students will present and defend their work in a session, which will be reported throughout the course..

Additionally, the organization of conferences or seminars with invited speakers that facilitate the acquisition of the competences of the subject will be considered.

## **4.3. Syllabus**

The course will address the following topics:

1. Educational purposes of teaching mathematics subjects in Secondary Education.
2. Curricular changes: the teaching of mathematics in the curricula of Secondary Education of the LGE (1970), LOGSE (1991) and LOE (2006).
3. Elements of the official curriculum -competences, objectives, contents, methodology and evaluation- of mathematics subjects in Secondary and Baccalaureate.
4. From curriculum design to didactic programming.
5. Epistemological and phenomenological foundations of mathematical content.
6. The didactic transposition.
7. Consequences for learning: mistakes, difficulties and obstacles.
8. Problem solving and didactical contract as starting points for mathematical learning.
9. The school genesis of mathematical objects: generating questions and tasks that develop it.

## **4.4. Course planning and calendar**

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first weeks of class, the ?Facultad de

Educacion? website and Moodle.

#### **4.5. Bibliography and recommended resources**

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?id=11851>