

63224 - Design of Learning Activities for Mathematics

Syllabus Information

Academic year: 2023/24

Subject: 63224 - Design of Learning Activities for Mathematics

Faculty / School: 107 - Facultad de Educación

Degree: 584 - Master's Degree in Teaching Compulsory Secondary Education
593 - Master's Degree in Teaching, specializing in Mathematics

ECTS: 8.0

Year: 1

Semester: Second semester

Subject type: Optional

Module:

1. General information

It is intended to provide students with the useful knowledge to transform the curricular prescriptions and didactic knowledge seen in 63223 into learning sequences for mathematics at the Secondary Education levels.

Objectives (understood as all with respect to the teaching-learning activities of Mathematics):

1. Know contexts in which mathematics is used or applied and use them to design activities.
2. Know some of the difficulties that have arisen throughout history in the evolution of mathematical notions and try to use the solutions that were generated to overcome them in the creation of activities.
3. Apply heuristic problem solving procedures and integrate problem solving into the design of activities.
4. Value and apply to teaching the elaboration of mathematical models for concrete situations and the logical-deductive reflection as an essential activity of mathematics.
5. Know, use and critically evaluate different methodological and didactic planning for teaching and learning mathematics.
6. Know, use and critically evaluate different didactic materials for each of the different blocks of contents and select the most adequate for a teaching purpose or elaborate them according to specific needs.
7. Know and apply technological and audiovisual resources in the teaching-learning process of mathematics
8. Know and use assessment techniques that stimulate student work in mathematics.

ODS: 4, 5 and 10 (<https://www.un.org/sustainabledevelopment/es/>).

2. Learning results

1. Explain the specific characteristics and difficulties of learning mathematics, establishing their relationship with the characteristics of the content to be taught and with the teaching processes followed.
2. Describe and critically comment on a wide repertoire of activities and resources for learning mathematics, related to different types of objectives, methodologies and learning styles.
3. Describe the main assessment tools and procedures and comment critically on their suitability for different types of educational objectives.
4. Design teaching proposals on the corresponding subjects, following the principles and criteria previously established in the theoretical framework of mathematics didactics.

3. Syllabus

1. Contexts and environmental situations in which mathematics is used or applied.

2. Integration of problem solving in the design of mathematics learning activities.
3. The elaboration of mathematical models for concrete situations and logical-deductive reflection as an essential activity of mathematics.
4. Didactic materials for each of the different content blocks.
5. Technological and audiovisual resources in the teaching-learning process of mathematics.
6. Evaluation techniques.

4. Academic activities

Lectures in which the teacher will present different teaching tools and resources, examples of methodological approaches, etc.

Interactive classes (active learning methodologies and work discussion) in which the teacher will propose case studies, project analysis and problem solving, and the involvement of students will be sought through their contributions, debate and proposed solutions.

Carrying out activities (elaboration of works) such as readings, exercises and problem solving, design of didactic games, etc., to be carried out both in the classroom, under the supervision of the teacher, and outside it, but always with the guidance support of the teaching staff.

Practical work oriented in individual and group tutoring sessions aimed at the realization of the work of evaluation of the subject

Tutoring sessions to resolve difficulties and discuss issues in relation to student assignments.

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

At certain times, which will be announced throughout the term, the interactive classes may be complemented with some external practices to be carried out outside class hours (collaboration in the organization of the Aragonese Mathematical Olympics, visit to a session of the Mathematical Talent Workshop, attendance to some educational innovation days or conferences). Alternatives will be provided for those students who are unable to participate.

5. Assessment system

Continuous assessment:

a-Active and quality participation in the practical classes and external practices and dossier of face-to-face and non-face-to-face practices (40%)

b-Presentation and public defence of a sequence of learning activities for a curricular content of mathematics of ESO or Bachillerato (60%): formal correctness and coherence with the fundamentals of instructional design, with the curriculum and the incorporation of resources and tools practiced during the term and the ability to respond to the teacher's indications to improve the text will be assessed. The ability to transmit clearly and accurately the information during the presentation and the ability to raise, discuss and answer questions during the defence will be valued.

Requirements to pass the subject:

1º) obtain at least 1.6 points out of 4 in activity a,

2º) obtain at least 3 points out of 6 in activity b,

3º) obtain at least 5 points out of 10 in the sum of the grades of activities a and b.

Fulfilling the three requirements, the grade will be the sum of the partial grades of a and b.

If all three requirements are not met, the grade will be the minimum between 4 and the sum of the partial grades.

The global test (not compulsory if the continuous evaluation is passed) in first and second call will consist of the following activities:

a) Written test on the contents (60 %). Assessment criteria:

-Use the criteria presented in the subject to design activities.

-Master the theoretical content of the subject.

-Use appropriate didactic-mathematical vocabulary.

-Correct use of the language in which the subject is taught.

b) Elaboration, design and defence of a sequence of learning activities for a curricular content of mathematics of ESO or Bachillerato (40%). This activity will be individual. The content and scope of the sequence of activities designed will be delivered one week before the date indicated for the written test set by the examination calendar. The defence will be made upon completion of the written test. The evaluation criteria will be as set forth in b.

To pass the subject it will be necessary to achieve:

1º) 3 points out of 6 in activity a',

2º) 2 points out of 4 in activity b',

Under these conditions, the final grade for the subject will be the sum of the grades obtained in a' and b'.

If any of the above conditions is not met, the grade will be the minimum between 4 points and the sum of the grades obtained in the evaluation activities a' and b'

For the second call, the student may keep, if desired, the grades obtained in one or more of the evaluation activities performed in the first global call

Fifth and Sixth calls: the evaluation criteria and requirements indicated above are applied depending on whether it is the first or second call of the school year.

Finally, it must be taken into account that the Regulations of the Norms of Coexistence of the University of Zaragoza will be applicable to the irregularities committed in the evaluation tests by means of academic fraud, as well as the application of article 30 of the Regulations of the Norms of Evaluation of Learning in relation to irregular practices other than academic fraud.