**SYLLABUS**

**regarding the qualification cycle FROM 2023TO 2026**

1.Basic Course/Module Information

|  |  |
| --- | --- |
| Course/Module title | Mathematics Education |
| Course/Module code \* |  |
| Faculty (name of the unit offering the field of study) | College of Social Sciences |
| Name of the unit running the course | Institute of Education (Pedagogy) |
| Field of study | Education |
| Qualification level | BA |
| Profile |  |
| Study mode | Full- time |
| Year and semester of studies | 2023/24winter semester |
| Course type | Lecture and classes |
| Language of instruction | English |
| Coordinator | Bozena Maj-Tatsis, PhD |
| Course instructor | Bozena Maj-Tatsis, PhD  Marta Pytlak, PhD |

\* - as agreed at the faculty

1.1.Learning format – number of hours and ECTS credits

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Semester  (n0.) | Lectures | Classes | Colloquia | Lab classes | Seminars | Practical classes | Internships | others | **ECTS credits** |
| 5 | 5 | 5 |  |  |  |  |  |  | 2 |

1.2. Course delivery methods

- conducted in a traditional way

- involving distance educationmethods and techniques

1.3. Course/Module assessment (exam, pass with a grade, pass without a grade)

Exam after second semester

2.Prerequisites

|  |
| --- |
| Basics of mathematics knowledge, including knowledge and skills necessary for early school and preschool education. |

3.Objectives, Learning Outcomes, Course Content, and Instructional Methods

3.1.Course/Module objectives

|  |  |
| --- | --- |
| O1 | Methodological preparation of students for mathematics education in kindergarten and in primary school in grades I – III. |
| O2 | Developing the ability to use didactic methods to conduct classes in pre-school and early school education for the development of operational reasoning in children. |
| O3 | Improving the ability to use the taxonomy of teaching objectives to implement the requirements contained in the curriculum of preschool and early school education. |
| O4 | Making students aware of the need to stimulate children's interest in mathematical thinking and show them the benefits of learning mathematics |

3.2.Course/Module Learning Outcomes (to be completed by the coordinator)

|  |  |  |
| --- | --- | --- |
| Learning Outcome | The description of the learning outcome  defined for the course/module | Relation to the degree programme outcomes |
| LO\_01 | The students will discuss the issues of mathematics education in kindergarten and in grades I – III of primary school (curriculum and mathematics education program). |  |
| LO\_02 | The students will describe the forms of activity of children, discuss the role of the students’ homework and describe the types and sources of typical students’ errors, as well as their role and ways of using them in the didactic process |  |
| LO\_03 | The students will characterize the methods of working with word problems, the use of graphic representations in calculation exercises and solving word problems, as well as techniques for developing calculation skills and strategies of clever calculations. They will describe the importance of using didactical games and plays to achieve didactic goals |  |
| LO\_04 | It will be able to developchildren’s interest in mathematics and show students the benefits of learning mathematics. |  |

**3.3. Course content (to be completed by the coordinator)**

1. Lectures

|  |
| --- |
| Content outline |
| Development of mathematical thinking of a child. Formation of mathematical concepts. |
| Developing mathematical activity of a child in the kindergarten andin the first grades of primary school. |
| Analogies in mathematics teaching. The use of analogy to solve mathematical problems. |
| Methods of solving word problems, different representations of solutions. |
| Didactic tools, games and activities supporting children's mathematical education. |

1. Classes, tutorials/seminars, colloquia, laboratories, practical classes

|  |
| --- |
| Content outline |
| **Pre-school education:**   * formation of the concept of number in its various aspects, in the range of the top ten with its exceeding - addition, subtraction, calculation, intuitions of multiplication and division; measuring length, fluids and time, weighing; time measurement; * formulating and solving elementary word problems; * shaping the concept of a set – classifying and ordering objects; * developing geometric intuitions in children,related to basic 2D and 3Dfigures. |
| **First grades of primary school education:**   * formation of the concept of set, natural numbers; * entering numbers and digits; * operations on natural numbers and their representations, order of operations; * word problems and methods of solving them (reductive, deductive, analytical-synthetic – reductive-deductive methods) * practical skills in mathematics education: monetary calculations, measurement of length, weight, volume, temperature and time. |

3.4.Methods of Instruction

*Lecture: a lecture supported by a multimedia presentation/ distance learning*

*Classes: text analysis and discussion/ group work (problem solving, case study, discussion)/didactic games*

4. Assessment techniques and criteria

4.1 Methods of evaluating learning outcomes

|  |  |  |
| --- | --- | --- |
| Learning outcome | Methods of assessment of learning outcomes (e.g., test, oral exam, written exam, project, report, observation during classes) | Learning format (lectures, classes,…) |
| LO-01 | Exam, Observation during classes | Lectures, classes |
| LO-o2 | Exam, Observation during classes | Lectures, classes |
| LO-03 | Exam, Observation during classes | Lectures, classes |
| LO-04 | Observation during classes | Lectures, classes |

4.2 Course assessment criteria

|  |
| --- |
| Active work in the classes and in a group, a final paper, passing the exam  The student receives points for the activities, the final paper and the exam. Let S be the sum of the points, then:  [0,50%S] – 2.0 (F)  (50%S,60%S] - 3.0 (E)  (60%S,70%S] - 3.5 (D)  (70%S,80%S] - 4.0 (C)  (80%S,90%S] - 4.5 (B)  (90%S,100%S] - 5.0 (A) |

5. Total student workload needed to achieve the intended learning outcomes

– number of hours and ECTS credits

|  |  |
| --- | --- |
| Activity | Number of hours |
| Scheduledcoursecontacthours | 10 |
| Other contact hours involving the teacher (consultation hours, examinations) | 2 |
| Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.) | 48 |
| Total number of hours | 60 |
| Total number of ECTS credits | 2 |

\* One ECTS point corresponds to 25-30 hours of total student workload

6. Internships related to the course/module

|  |  |
| --- | --- |
| Number of hours |  |
| Internship regulations and procedures |  |

7. Instructional materials

|  |
| --- |
| Compulsory literature:  Mason J., Burton, L., Stacey, K.: (2010) "Thinking Mathematically", Second Edition, Pearson Education Limited: England.  Lyn D. English, David Kirshner (Eds.) (2015) “Handbook of International Research in Mathematics Education”, Routledge: New York.  Schoenfeld, A. H. (2006*). “*Mathematics teaching and learning”. In P. A. Alexander & P. H. Winne (Eds.), Handbook of Educational Psychology (2nd ed., pp. 479-510). Mahwah, NJ: Erlbaum.  E. Swoboda, J. Gunčaga (Eds.) (2009) "Child and mathematics", WydawnictwoUniwersytetuRzeszowskiego: Rzeszow.  Selected articles in Mathematics Education |
| Complementary literature:  B. Maj, M. Pytlak, E. Swoboda (red.): (2008), „Supporting independent thinking through mathematical education", WydawnictwoUniwersytetuRzeszowskiego, Rzeszów  B. Maj-Tatsis, K. Tatsis (red.): (2012), „Generalization at all educational levels”, WydawnictwoUniwersytetuRzeszowskiego, Rzeszów  B. Maj-Tatsis, M. Pytlak, E. Swoboda (red.): (2016), „Inquiry based mathematical education”, WydawnictwoUniwersytetuRzeszowskiego, Rzeszów.  B. Maj-Tatsis, K. Tatsis, E. Swoboda (red.): (2018), „Mathematics in the real world", WydawnictwoUniwersytetuRzeszowskiego, Rzeszów.  Selected articles in Mathematics Education |

Approved by the Head of the Department or an authorised person