INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Numbers and Operations			Field of study	Training in Teaching Area		
Bachelor in	Basic Education			School	School of Education		
Academic Year	2022/2023	Year of study	2	Level	1-2	ECTS credits	6.0
Type	Semestral	Semester	1	Code	9853-531-2105-00-22		

Workload (hours)	162	Contact hours	T	TP	PL	TC	S	E	OT	O
			-	54	-	-	-	-	18	-

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s): Manuel Celestino Vara Pires, Paula Maria Pereira de Barros

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Identify numerical concepts and procedures in diversified contexts.
2. Apply numerical concepts and procedures in diversified contexts.
3. Use different mathematical representations of a given numerical concept in an appropriate manner.
4. Work independently, researching, collecting, interpreting and presenting information.
5. Solve mathematical problems, communicating their own ideas and interpreting the other people's ideas.

Prerequisites

Before the course unit the learner is expected to be able to:
1. Relate and use basic mathematic concepts.
2. Read and interpret mathematical information.

Course contents

1. Numbers and numerical sets. 2. Historical evolution of numbering. 3. Numeration systems and place value. 4. Operations in N, No, Z and Q and their properties. 5. Introduction to number theory.

Course contents (extended version)

1. Numbers and numerical sets.
   - Natural, integers, rational and real numbers.
   - N, No, Z, Q, R.
2. Historical evolution of numbering.
   - Evolution of our numbering.
   - Representation of numbers in other cultures.
3. Numeration systems and place value.
   - Types of numeration systems.
   - Indo-Arabic numeration system.
   - Base, position, representing numbers.
4. Operations in N, No, Z and Q and their properties.
   - Addition, subtraction, multiplication, division.
   - Main properties.
   - Calculation processes.
5. Introduction to number theory.
   - Divisors and multiples of a number, greatest common divisor and lowest common multiple.
   - Divisibility rules for numbers.
   - Primes.

Recommended reading

1. Katz, V. (2004). The history of Mathematics: Brief version. Person Education.
2. Palhares, P. (Coord.) (2004). Elementos de matemática para professores do ensino básico. Lidel.
3. Palhares, P., Gomes, A., & Amaral, E. (Coords.) (2011). Complementos de matemática para professores do ensino básico. Lidel.
4. Reis, R., & Fonseca, M. J. (2010). Números e operações. Universidade Aberta.
5. Sequeira, L., Freitas, P., & Nápoles, S. (2009). Números e operações. PFCM, DGIDC, Ministério da Educação.

Teaching and learning methods

1. Content exploration using, for example, explanation processes, texts discussions, writing reports or researching work. 2. Discussions of themes in small or large groups. 3. Individual or group work. 4. Resolution of tasks of different type and nature.

Assessment methods

1. Continuous assessment - (Regular, Student Worker) (Final)
   - Intermediate Written Test - 30% (Written summative test.)
   - Intermediate Written Test - 30% (Written summative test.)
   - Work Discussion - 40% (Implementation and discussion of the proposed tasks or the individual or group works.)
2. Assessment by examination - (Regular, Student Worker) (Supplementary, Special)
   - Final Written Exam - 100%

Language of instruction

Portuguese

Electronic validation

Manuel Celestino Vara Pires	Maria Cristina do Espírito Santo Martins	Elza da Conceição Mesquita	Carlos Manuel Costa Teixeira
12-12-2022	19-12-2022	20-12-2022	02-01-2023