Informatics and Programming

Calendar: 1st day semester

Contact Hours: T 37,5h; OT 7,5h

Scientific Area: Mathematics and computer science

Intended learning outcomes (knowledge, skills and competences to be developed by the students):

The student should be able to form a solid base in the programming abstract concepts, allowing the students to adapt to new programming languages; Preform an introduction to Visual Basic Language, using the previously learned abstract concepts to a specific programming language. Master the concepts behind a spreadsheet and its correct use; Master the VBA (Visual Basic for Applications) programming language.

Syllabus:

Formatting cells, cells references, graphics, predefined functions. VBA: construction of functions and macros.

Programming Techniques: Top-Down Approach, constants, variables, expressions and functions.

Pseudo code: Structure of an algorithm, declaring variables, assigning values, comments, input and output commands, basic structures (sequential, conditional and repeating).

Flowchart vs pseudo code: Symbology, structure, declaring variables, assigning values, inputs and outputs, the basic structures. Composite variables, modules.

Visual Basic - analogy between pseudo code and flowchart. Object oriented programming and event driven programming, code and VB fundamentals - variables, arrays, constants, assignment, control flow instructions, repetition. Available working objects. Correction of coding errors: syntax and semantic errors.

Evidence of the syllabus coherence with the curricular unit's intended learning outcomes:

For the student to form a solid foundation in the abstract concepts of programming, the main programming techniques will be taught. The concept of "spaghetti code" will also be explained. The basic structures of programming will be explained, as well as ways of representing algorithms – pseudo code and flowchart.

The Visual Basic programming language will be used to introduce the student to different stages of program building. The main components of this language will be introduced.

In order to the to master the concepts of using a spreadsheet and the concepts of programming VBA - Visual Basic for Applications, the student will be introduced to the elements needed to build a spreadsheet.

The concepts of building formulas will be taught, supported by exercises, and the main pre-defined functions in Excel will be addressed.

Bibliografia principal:

Buyens, J. (2006). Aprender + Programação, McGraw-Hill.

Curtis, F. (2006). Microsoft Office Excel 2007 Step by Step, Microsoft Press.

Jacobson, R. (2007). Microsoft Office Excel 2007 Visual Basic for Applications, Step by Step, Microsoft Press.

Pereira, V. (2010). O Guia Prático do Visual Basic 2010 Express, CentroAtlântico.