

Informatics and Programming

Calendar: 1st day semester

Contact Hours: 37h50 TP

Scientific Area: Matemática e Informática

Learning outcomes of the curricular unit

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

Chapter 1 - 4 wk.

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

Chapter 2 - 4 wk.

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

Chapter 3 - 1.5 wk.

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

Chapter 4 - 1.5 wk.

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

Chapter 5 - 3 wk.

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.

Chapter 6 - 1 wk.

Reviews

Demonstration of the syllabus coherence with the curricular unit's objectives

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

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

For the student master the concepts of using a spreadsheet and holds the concepts of programming VBA - Visual Basic for Applications, will be introduced the elements needed to build a spreadsheet. Will be taught the concepts of building formulas, supported by exercises, and addressed the main pre-defined functions in Excel.

Teaching methodologies (including evaluation):

Theoretical/practical classes will be taught using an expositive technique, by using a projector and PowerPoint slides. The aim is to gain the students attention, developing their ability to think and to solve new problems.

A computer will be used in order to solve the practical exercises.

The evaluation will consist of:

- A written exam with a weight of 50% in the final grade;
- Two papers on the worksheet, with the weight of 10% each;
- A final project for Visual Basic, with a weight of 30%

Demonstration of the coherence between the teaching methodologies and the learning outcomes.

For the student to achieve the key learning objectives identified for this course, i.e., form a solid foundation in programming concepts, able to build computer programs going through its different phases, and also to grasp the concepts of construction and use of a spreadsheet, it is considered that the most appropriate methodology would be the use of practical classes, with informatics resources as a support tool. This is because it is the domain of theoretical concepts that can later be tested and practiced, either through written exercises, or with the use of computer tools, such as PC's and programming languages.

Thus, it is possible to learn the theoretical concepts always interconnected with a practical explanation of each concept. For this purpose we use the video projector to display the slides with the matter, which allow the teacher to carry out practical exercises to illustrate its application.

The Pc's laboratory are used by students (individually or in groups of two) so they can follow the explanation of the teaching and conduct practical exercises on the subject.