

MC102: Algorithms and Computer Programming

Since 2011.

Prerequisite: None

Description:

Basic concepts on computer organization. Construction of algorithms and its representation on pseudocode and high level languages. Systematic development and programs implementation. Structuring, debugging, tests and documentation of programs. Problem solving.

Programme:

Topics to be studied (preferably in this order)

1. Computing environment's basic organization
2. Variables, constants and attributions
3. Data input and output
4. Arithmetic, logic and relational expressions
5. Conditional commands
6. Repeat commands
7. Arrays and Strings
8. Matrices
9. Functions
10. Variable scope
11. Pointers and dynamic allocation of arrays
12. Sorting algorithms
13. Search algorithms
14. Enumerated Types and structures
15. Text and binary files
16. Recursion

Recommended Literature:

- I. P. Feofiloff. Algoritmos em Linguagem C. Campus-Elsevier, 1st edition, 2009
- II. H. M. Deitel, P. J. Deitel. C - Como Programar, 6th edition, Pearson Education, 2011
- III. B. W. Kernighan, D. M. Ritchie. The C Programming Language, 2nd edition, Prentice-Hall, 1988
[Translation to portuguese: C - A Linguagem de Programação. Editora Campus, 1989]
- IV. J. L. Szwarcfiter, L. Markenzon. Estruturas de Dados e seus Algoritmos, 3rd edition, Editora LTC, 2010
- V. W. Celes, R. Cerqueira, J.L. Rangel. Introdução a Estruturas de Dados, 1st edition, Editora Campus, 2004
- VI. N. Ziviani. Projeto de Algoritmos com Implementações em Pascal e C, 3rd edition, Editora Cengage Learning, 2011
- VII. T. Cormen, C. Leiserson, R. Rivest, C. Stein. Algoritmos - Teoria e Prática, 3rd edition, Editora Campus, 2012
- VIII. R. Sedgewick, K. Wayne. Algorithms, 4th edition, Addison-Wesley, 2011
- IX. A. Kelley, I. Pohl. A Book on C, 4th edition, Addison Wesley, 1998