UNIVERSIDADE DE AVEIRO
DEPARTAMENTO DE ELECTRÓNICA, TELECOMUNICAÇÕES E INFORMÁTICA

Programming Elements (2023/24)

General info (version of September 15, 2023)

Instructors

- Armando J. Pinho (ap@ua.pt)

Grading

- Theoretical component: Individual final written exam, 40%
- Practical component: Based on programming assignments, 60%
  - The assignments are performed in groups of two or three students
  - In the report of each assignment, it should be stated the percentage of participation of each member of the group
- Minimum of 8 points in each component

Learning objectives

At the end of this course, the students should:

- Understand the fundamental concepts of the C programming language to solve problems
- Be able to develop, understand, test and debug programs in the C programming language, in a Linux environment
- Use programming techniques that avoid common programming errors; use fundamental defensive programming practice; be able to perform individual and team code review; use established design principles to organize a software system
- Use, implement and evaluate fundamental data structures and associated algorithms
- Analyze algorithms; select and use algorithmic strategies to solve problems

Course contents

- Review of fundamental computer concepts
- Specification of problems and algorithms
- Basic elements of the C programming language
- Flow and repetition control structures
- Modular programming: functions

- Function parameters
- Pointers and arrays
- Strings
- Data structures
- Text and binary files
- Function libraries
- Software build automation
- Debugging tools

Website

- `http://elearning.ua.pt/`

Main bibliography

- Z. A. Shaw. *Learn C the Hard Way*, Addison-Wesley, 2016.
- K. N. King. *C Programming: A Modern Approach*, W. W. Norton & Company, 2nd Ed, 2008.
- Brian W. Kernighan and Dennis M. Ritchie. *The C Programming Language*, Prentice Hall Software Series, 2nd Ed, 1988.
- Anita Goel and Ajay Mittal. *Computer Fundamentals and Programming in C*, Pearson, 2016.
- Pradip Dey and Manas Ghosh. *Computer Fundamentals and Programming in C*, Oxford University Press, 2nd Ed, 2013.
- Peter Prinz and Tony Crawford. *C in a Nutshell*, O'Reilly, 2nd Ed, 2016.

Final remarks

- This is a 6 ECTS course, implying, on average, a total of about $6 \times 30 = 180$ hours of work.
- Academic dishonesty will not be tolerated. Academic dishonesty involves acts, such as,
  - Cheating on an examination or quiz.
  - Substituting for another person during an examination or allowing such substitution for one's self.
  - Plagiarism. Act of appropriating passages from the work of another individual, either word for word or in substance, and representing them as one's own work. This includes any submission of written work other than one's own.
  - Collusion with another person in the preparation or editing of assignments submitted for credit, unless such collaboration has been approved in advance by the instructor.

  If you have doubts regarding a certain action, ask the instructors.