Academic course description

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| BACHELOR ‘S PROGRAMME1st YEAR OF STUDY, 2nd SEMESTER |

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| **Course title** | | **Programming Languages** |
| Course code | |  |
| Course type | | full attendance |
| Course level | | 1st cycle (bachelor’s degree) |
| Year of study, semester | | 1st year of study, 2nd semester |
| Number of ECTS credits | | 5 |
| Number of hours per week | | 4 (2 lecture hours + 2 seminar / laboratory hours) |
| Name of lecture holder | | Assoc. prof. Laurențiu STOLERIU |
| Name of seminar holder | | Lect. Petronel POSTOLACHE, Assoc. prof. Laurențiu STOLERIU |
| Prerequisites | | Advanced level of English language |
| A | **General and course-specific competences** | |
|  | **General competences**:   * Achievement of professional tasks efficiently and responsibly, in compliance with the field-specific deontology legislation, with qualified assistance. * Effective use of information sources and communication resources and assisted professional training, both in Romanian and in a foreign language.   **Course-specific competences**:   * Identification of IT basics use (algorithms, programming languages, specific software, numerical modeling) in the study of Physics. * Explanation of the specific steps needed to develop algorithms for solving average difficulty problems * Proper use of numerical methods and mathematical statistics in the analysis and processing of specific physical data * Elaboration of graphs and reports for explaining and interpreting physical results obtained by statistical methods * Making connections between knowledge of Physics and of other domains (Chemistry, Biology, Informatics, etc.) | |
| B | **Learning outcomes** | |
|  | Upon successful completion of this course, students will be able to:   * Use numerical modeling tools to describe physics problems. * Identify, describe and control numerical error sources. * Analyze the results of numerical simulations and establish pronouncements from them. | |
| C | **Lecture content** | |
|  | * Physicists and computer programming. Phases of programing. * A first glossary of C. Syntax elements * Language commands in C * Fundamental data types * Representing numbers in memory. Bit operations * Functions * Pointers, strings and multi-dimensional arrays * Pointers arithmetics. Initialize. Dynamic memory allocation * Strings of characters. The string.h library. Data structures * Example of solving a physics problem with a computer. * Other programming languages often used in science and their relationship to C language. | |
| D | **Recommended reading for lectures** | |
|  | - http://stoner.phys.uaic.ro/moodle/  - Liviu Negrescu, Limbajele C şi C++ pentru începători, Ed. Microinformatica, 1996.  - Stanford CS Essential C, http://cslibrary.stanford.edu/101/EssentialC.pdf  - Kernighan B.W. & Ritchie D.M.: The C Programming Language, Prentice Hall 1988. (ANSI C edition).  - https://en.wikibooks.org/wiki/C\_Programming | |
| E | **Seminar / Laboratory content** | |
|  | Familiarize yourself with the work environment  Simple programs. Mathematical operations, inputs - outputs  Fundamental data types. Control instructions  Review. Test.  Functions. Pointers. Strings. Dynamic memory allocation  Strings of characters. Data structures | |
| F | **Recommended reading for seminars** | |
|  | - http://stoner.phys.uaic.ro/moodle/  - Liviu Negrescu, Limbajele C şi C++ pentru începători, Ed. Microinformatica, 1996.  - Stanford CS Essential C, http://cslibrary.stanford.edu/101/EssentialC.pdf  - Kernighan B.W. & Ritchie D.M.: The C Programming Language, Prentice Hall 1988. (ANSI C edition).  - https://en.wikibooks.org/wiki/C\_Programming | |
| G | **Education style** | |
| learning and teaching methods | | Lecture, exemplification |
| assessment methods | | * Written test * Practical test |
| Language of instruction | | English |