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.)
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| 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.
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| 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.
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| 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 environmentSimple programs. Mathematical operations, inputs - outputsFundamental data types. Control instructionsReview. Test.Functions. Pointers. Strings. Dynamic memory allocationStrings 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
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| Language of instruction | English |