## BACHELOR'S PROGRAMME 1<sup>st</sup> YEAR OF STUDY, 2<sup>nd</sup> SEMESTER

COURSE TITLE	PROGRAMMING LANGUAGES	
Course code		
COURSE TYPE	full attendance	
COURSE LEVEL	1 <sup>st</sup> cycle (bachelor's degree)	
YEAR OF STUDY, SEMESTER	1 <sup>st</sup> year of study. 2 <sup>nd</sup> semester	
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	$\frac{1}{4}$ (2 lecture hours + 2 laboratory hours)	
	Prof. dr. Laurentiu STOLERILL	
	Last dr. Patronal POSTOLACHE	
	Advanced level of English	
PROFESSIONAL AND TRANSVERSAL COMPETENCES		
<ul> <li>Identification of IT basics use (algorithms, programming languages, specific software, numerical modeling) in the study of Physics.</li> <li>Explanation of the specific steps needed to develop algorithms for solving average difficulty problems</li> <li>Proper use of numerical methods and mathematical statistics in the analysis and processing of specific physical data</li> <li>Elaboration of graphs and reports for explaining and interpreting physical results obtained by statistical methods</li> <li>Making connections between knowledge of Physics and of other domains (Chemistry, Biology, Informatics, etc.)</li> </ul> <b>Transversal competences:</b> <ul> <li>Achievement of professional tasks efficiently and responsibly, in compliance with the field-specific deontology legislation, with qualified assistance.</li> <li>Effective use of information sources and communication resources and assisted professional training in English.</li> </ul> <b>B LEARNING OUTCOMES Upon successful completion of this discipline, students will be able to:</b> <ul> <li>Use numerical modeling tools to describe physics problems.</li> </ul>		
Identify, describe and control numerical error sources.     Analyze the results of numerical simulations and establish pronouncements from them		
Physicists and computer programming. Phases of programing. A first glossary of C. Syntax elements Language commands in C Fundamental data types in C Functions in C Pointers, strings and multi-dimensional arrays. Pointer arithmetics. Dynamic memory allocation. Strings of characters. The string.h library.		
Introduction to Python. Values and data types Python: variables, statements, operators Functions in Python. Type conversions, mathematical functions		
Lists, tuples, dictionaries in Python. Numerical approaches in Python. numpy, scipy and matplotlib.		
D RECOMMENDED READING FOR LECTURES		
<ol> <li>- http://stoner.phys.uaic.ro/moodle/</li> <li>- Stanford CS Essential C, http://cslibrary.stanford.edu/101/EssentialC.pdf</li> <li>- Brian Kernighan, Dennis Ritchie, Limbajul de programare C, Ed. Teora, 2001.</li> </ol>		
E EABORATORT/ DEPINTING CONTENT		
Simple programs. Mathematical operations, inputs - outputs Fundamental data types. Control instructions. Functions. Pointers. Strings. Dynamic memory allocation Applications in Python: variables, statements, operators, functions. Test		
F RECOMMENDED READING FOR	LABORATORY/SEMINARS	
<ol> <li>- http://stoner.phys.uaic.ro/moodle/</li> <li>- Brian Kernighan, Dennis Ritchie, Limbajul de programare C, Ed. Teora, 2001.</li> <li>- Stanford CS Essential C, http://cslibrary.stanford.edu/101/EssentialC.pdf</li> </ol>		

4 https://en.wikibooks.org/wiki/C_Programming	
G EDUCATION STYLE	
LEARNING AND TEACHING METHODS	Lecture, guided discovery, debate, problem solving
ASSESSMENT METHODS	<ul> <li>Written exam – 67%</li> <li>10 lab works and lab test – 33%</li> </ul>
LANGUAGE OF INSTRUCTION	English