

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

COURSE TITLE	<b>PROGRAMMING LANGUAGES</b>
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
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
<b>A</b>	<b>GENERAL AND COURSE-SPECIFIC COMPETENCES</b>
	<p><b>General competences:</b></p> <ul style="list-style-type: none"> <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, both in Romanian and in a foreign language.</li> </ul> <p><b>Course-specific competences:</b></p> <ul style="list-style-type: none"> <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>B</b>	<b>LEARNING OUTCOMES</b>
	<p>Upon successful completion of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>→ Use numerical modeling tools to describe physics problems.</li> <li>→ Identify, describe and control numerical error sources.</li> <li>→ Analyze the results of numerical simulations and establish pronouncements from them.</li> </ul>
<b>C</b>	<b>LECTURE CONTENT</b>
	<ul style="list-style-type: none"> <li>• Physicists and computer programming. Phases of programing.</li> <li>• A first glossary of C. Syntax elements</li> <li>• Language commands in C</li> <li>• Fundamental data types</li> <li>• Representing numbers in memory. Bit operations</li> <li>• Functions</li> <li>• Pointers, strings and multi-dimensional arrays</li> <li>• Pointers arithmetics. Initialize. Dynamic memory allocation</li> <li>• Strings of characters. The string.h library. Data structures</li> <li>• Example of solving a physics problem with a computer.</li> <li>• Other programming languages often used in science and their relationship to C language.</li> </ul>
<b>D</b>	<b>RECOMMENDED READING FOR LECTURES</b>
	<ul style="list-style-type: none"> <li>- <a href="http://stoner.phys.uaic.ro/moodle/">http://stoner.phys.uaic.ro/moodle/</a></li> <li>- Liviu Negrescu, Limbajele C și C++ pentru începători, Ed. Microinformatica, 1996.</li> <li>- Stanford CS Essential C, <a href="http://cslibrary.stanford.edu/101/EssentialC.pdf">http://cslibrary.stanford.edu/101/EssentialC.pdf</a></li> <li>- Kernighan B.W. &amp; Ritchie D.M.: The C Programming Language, Prentice Hall 1988. (ANSI C edition).</li> <li>- <a href="https://en.wikibooks.org/wiki/C_Programming">https://en.wikibooks.org/wiki/C_Programming</a></li> </ul>
<b>E</b>	<b>SEMINAR / LABORATORY CONTENT</b>
	<p>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</p>

F	RECOMMENDED READING FOR SEMINARS	
	<ul style="list-style-type: none"> <li>- <a href="http://stoner.phys.uaic.ro/moodle/">http://stoner.phys.uaic.ro/moodle/</a></li> <li>- Liviu Negrescu, Limbajele C și C++ pentru începători, Ed. Microinformatica, 1996.</li> <li>- Stanford CS Essential C, <a href="http://cslibrary.stanford.edu/101/EssentialC.pdf">http://cslibrary.stanford.edu/101/EssentialC.pdf</a></li> <li>- Kernighan B.W. &amp; Ritchie D.M.: The C Programming Language, Prentice Hall 1988. (ANSI C edition).</li> <li>- <a href="https://en.wikibooks.org/wiki/C_Programming">https://en.wikibooks.org/wiki/C_Programming</a></li> </ul>	
G	EDUCATION STYLE	
LEARNING AND TEACHING METHODS	Lecture, exemplification	
ASSESSMENT METHODS	<ul style="list-style-type: none"> <li>• Written test</li> <li>• Practical test</li> </ul>	
LANGUAGE OF INSTRUCTION	English	