



COMPUTER SCIENCE FOR PHYSICS

Enrollment year	2021/2022
Academic year	2021/2022
Regulations	DM270
Academic discipline	FIS/01 (EXPERIMENTAL PHYSICS)
Department	DEPARTMENT OF PHYSICS
Course	PHYSICS
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	2nd semester (01/03/2022 - 15/06/2022)
ECTS	6
Lesson hours	60 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	NEGRI ANDREA (titolare) - 4 ECTS COSTANZA SUSANNA - 2 ECTS
Prerequisites	None. The lectures start from computer science basics.
Learning outcomes	The course provides an introduction to basic computer science and is aimed at the typical applications in physics. The lessons, rather than being focused on a specific programming language, are characterized by a pragmatic approach to computer science aimed at teaching learning methods, simulation techniques, data analysis and debugging procedures.
Course contents	The first part of the course illustrates the principles of operation of computers, their main components and operating systems. Main topics are: the Linux operating system, widely used in research, the unix commands and the shell scripts used to automate procedures. The basic concepts of procedural programming languages ??and object-oriented languages ??are then presented. As an example of a

	<p>language currently used in a physical research environment, an introduction to C ++ is provided. The course is an hands-on introduction to computer science, therefore the main focus is on the exercises in computer lab. The students, for example, will develop in C ++ the simulation of a problem typical of classical physics. The data analysis program (ROOT), developed at CERN, is used as graphical library.</p>
Teaching methods	<p>The lectures are assisted by OpenOffice presentations, that will be made available to students in pdf format via the Kiro platform. Since this is an hands-on course, all the topics presented during the lectures will be reproduced by the students in the computer lab via the implementation of ad-hoc programs.</p>
Reccomended or required readings	<p>The slides provided by the teacher already cover all the topics presented and are sufficient for the preparation of the final exam. Eventually, if the student deems it necessary, he can complete the preparation with any introductory manual to C ++, such as http://www.learncpp.com/</p>
Assessment methods	<p>Develop a project that entails the concept introduced during the lectures.</p>
Further information	<p>Develop a project that entails the concept introduced during the lectures.</p>
Sustainable development goals - Agenda 2030	<p>\$lbl_legenda_sviluppo_sostenibile</p>