



Course unit English denomination	Scientific Computing for Physics Students
Teacher in charge (if defined)	Alessandro Renzi
Teaching Hours	24
Number of ECTS credits allocated	3
Course period	February -May
Course delivery method	☒ In presence ☐ Remotely ☐ Blended
Language of instruction	English
Mandatory attendance	☒ Yes (50% minimum of presence) ☐ No
Course unit contents	The course provides skills in using tools for developing scientific software for physics, covering development environments, programming languages, algorithms, data structures, parallel and GPU computing, FFTs, Monte Carlo techniques, machine learning, and code optimization. Languages covered include C, C++, Fortran, Python, Julia and Mathematica.
Learning goals	Acquire knowledge and abilities in using scientific languages, managing Linux environments, implementing numerical algorithms and data structures, following software development best practices, and utilizing high-performance computing techniques.
Teaching methods	Lectures, hands-on coding exercises, case studies, group work.
Course on transversal, interdisciplinary, transdisciplinary skills	☐ Yes ☒ No
Available for PhD students from other courses	☒ Yes ☐ No
Prerequisites (not mandatory)	Basic knowledge of programming and numerical computing.
Examination methods	Final coding project
Suggested readings	Suggestions for books or websites for scientific computing related to the course modules will be provided during the lectures.
Additional information	Course designed for theorists and experimentalists.