



Course unit English denomination	Scientific Computing for Physics Students
SS	<b>PHYS-01/A, PHYS-02/A, PHYS-03/A, PHYS-04/A, PHYS-05/A, PHYS-05/B, PHYS-06/A</b>
Teacher in charge	Alessandro Renzi
Teaching Hours	24
Number of ECTS credits allocated	3
Course period	March - June 2026
Course delivery method	<input checked="" type="checkbox"/> In presence <input type="checkbox"/> Remotely <input type="checkbox"/> Blended
Language of instruction	English
Mandatory attendance	<input checked="" type="checkbox"/> Yes (50% minimum of presence) <input type="checkbox"/> 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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Available for PhD students from other courses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Prerequisites	Basic knowledge of programming and numerical computing



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(not mandatory)

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Examination methods  
(if applicable)      Final coding project with weekly handouts

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Suggested readings      Suggestions for books or websites for scientific computing related to the  
course modules will be provided during the lectures.

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Additional information      Course designed for theorists and experimentalists.

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