



Course unit English denomination	Fluid mechanics for the functional assessment of cardiovascular devices
Teacher in charge (if defined)	Francesca M. Susin
Teaching Hours	24
Number of ECTS credits allocated	4
Course period	January-february 2026
Course delivery method	<input checked="" type="checkbox"/> In presence <input type="checkbox"/> Remotely <input checked="" type="checkbox"/> Blended
Language of instruction	English. In case of Italian students only the course will be taught in Italian.
Mandatory attendance	<input checked="" type="checkbox"/> Yes (80% minimum presence) <input type="checkbox"/> No
Course unit contents	The course is aimed at giving a survey of research approaches for the assessment of cardiovascular medical devices. Emphasis will be given to methods and techniques adopted for the analysis of hemodynamic performance of prosthetic heart valves. Students will be encouraged in developing and reinforcing their own autonomous ability of building up a research in a highly multidisciplinary field as applied biofluid dynamics is.
Learning goals	Topics that will be covered: Review of basic fluid mechanics concepts. Definition of hydrodynamic performance of artificial cardiac valves and ventricular assist devices. Local and global approaches in in-vitro and in-silico models. Cardiac overload. Blood particles damage. Pulse duplicator loops and experimental techniques.
Teaching methods	Frontal classes with a continuous interaction with and among students. Approaches: <ul style="list-style-type: none"><li>• critical thinking</li><li>• group work</li><li>• interactive teaching</li><li>• fostering creativity</li><li>• authentic and easy relationships among participant</li><li>• cooperation and support among peers</li></ul>
Course on transversal, interdisciplinary, transdisciplinary skills	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



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Available for PhD  
students from  
other courses

☒ Yes

☐ No

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Prerequisites  
(not mandatory)

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Examination  
methods  
(in applicable)

Discussion of a project work assigned during the course

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Suggested  
readings

Course slides and recent literature that will be chosen during the course

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Additional  
information

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PHD COURSE IN SCIENCES OF CIVIL,  
ENVIRONMENTAL AND ARCHITECTURAL  
ENGINEERING