



BIOMACHINES

Enrollment year	2014/2015
Academic year	2014/2015
Regulations	DM270
Academic discipline	ING-IND/34 (INDUSTRIAL BIOENGINEERING)
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	BIOENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	2nd semester (02/03/2015 - 12/06/2015)
ECTS	6
Lesson hours	45 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	GHILARDI PAOLO - 6 ECTS
Prerequisites	Basic knowledge of Fluid Mechanics and of Partial Differential Equations
Learning outcomes	The student will gain a basic knowledge on how Biomachines are made and work, will be able to understand and to develop mathematical models of biomachines on the basis of fluid dynamics concepts, will know the fundamental concepts of cardiovascular fluid dynamics and of its modelling strategies.
Course contents	Fluid dynamics of cardiovascular systems Hemodialysis machines Prosthetic heart valves

	<p>arterial pressure measurement</p> <p>Heart-lung machines</p> <p>Mathematical models of hemodynamics</p> <p>One dimensional modelling of pulsatile flow</p>
Teaching methods	lectures, practical work with computers
Reccomended or required readings	<p>lecture notes available on Kiro.</p> <p>Kundu, P.K., Cohen, I.M.. Fluid Mechanics. Elsevier. With particular reference to the chapter "Introduction to Biofluid Mechanics".</p> <p>Miller,G.E.. Artificial Organs. Morgan & Claypool.</p>
Assessment methods	<p>During the final written test the candidate should be able to understand how Biomachines are made and work, to understand and to develop mathematical models of biomachines based on fluid dynamics, know the fundamental concepts of cardiovascular fluid dynamics and of its modelling strategies.</p>
Further information	
Sustainable development goals - Agenda 2030	\$lbl_legenda_sviluppo_sostenibile