UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Modeling and Simulation I

2526-4-H4102D089-H4102D096M

Aims

To provide the concepts necessary to understand the modeling and simulation tools for the cardiovascular system, and to critically analyze the outputs

Contents

The clerkship covers the most important aspects related to theoretical models of cardiovascular fluid mechanics. Students will acquire the basic knowledge required to investigate blood flow distribution and the role of physical parameters in cardiovascular function.

Detailed program

1. Application of theoretical models to cardiovascular fluid dynamics
2. Boundary conditions and physical properties of biological tissues to be considered in hemodynamic simulations
3. Practical use of a software for image segmentation, blood flow and cardiac simulations

Prerequisites

Basic knowledge of the foundations of cardiovascular physiology, hemodynamic modeling and information technology.

Teaching form

Lectures on hemodynamic simulations
Analysis of a hemodynamic segmentation and simulation software
Practical simulation activities

Textbook and teaching resource

Open Source software SimVascular
Online dcumentation and tutorials on SimVascular
Image dataset for practical examples
Slides of the course

Semester

First Semester

Assessment method

Evaluation of practical skills on the use of the numerical hemodynamic simulation software through an application example in large arteries.
Verification will take place through the delivery of a report detailing the results obtained on the proposed application case.

Office hours

Contact by e-mail

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING