

# UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### **Modeling and Simulation II**

2021-4-H4102D027-H4102D097M

### Aims

To provide basic concept of blood flow numerical analysis and the use of simulation tolls.

#### Contents

The clerkship will cover theoretical modeling of blood flow fields and numerical analysis.

#### **Detailed program**

- 1) The continuum mechanics approach
- 2) 3D flow field description: tensor, vector and scalar fields
- 3) Conservation of mass, momentum and energy balance
- 4) Advection, diffusion, and divergence free constraint.
- 5) "Solving" the Navier-Stokes equations with numerical simulations
- 6) Imposing boundary conditions and understanding numerical simulations

#### Prerequisites

Basic knowledge of fundamentals in physics, morphology and physiology of the cardiovascular system.

#### **Teaching form**

Teaching of basic concepts and practical demonstration on the use of software tools.

#### Textbook and teaching resource

To be defined.

#### Semester

**First Semester** 

#### Assessment method

Evaluation of knowledge of theoretical principle and of the practical skills.

#### Office hours

Contact by e-mail