

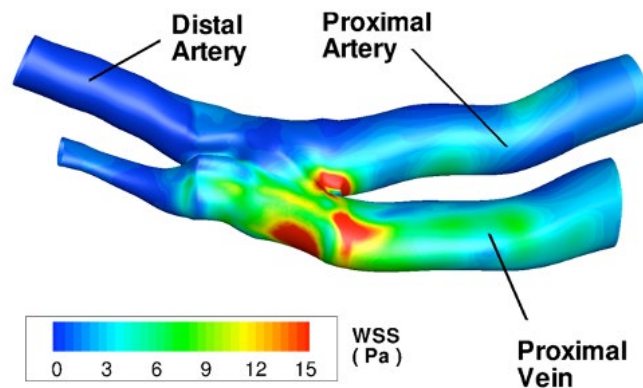
BN4202 ANALYTICAL AND COMPUTATIONAL ANALYSIS OF BIOFLUID DYNAMICS

WHAT IS THIS COURSE ABOUT?

In this course, we will discuss about how to analyze biofluid problems both analytically and computationally. During lectures, we will focus more on analytical solutions of biofluid dynamics while through a group project, students will be introduced to computational simulations. This course will cover the following topics:

1. Mathematical concepts for solving fluid dynamics problems
2. Fundamental fluid mechanics
3. Navier-Stokes equations to describe steady and unsteady flows
4. Non-Newtonian blood flows
5. Pulsatile blood flows
6. Mass transport in blood vessels
7. Computational simulations for steady and unsteady blood flows
8. Blood flows in pathophysiological conditions

Course Assessment: 60% Group Project, 40% Final Exam



WHY YOU SHOULD CONSIDER THIS COURSE?

More than 60% by weight of the human body is fluid. In addition, our organs need blood circulation for mass and heat transfer. Fluid mechanics knowledge is crucial to better understand how our body is adapted to support such physiological processes. This course is the only course where students can learn about the computational simulation of biofluids in our undergraduate program. Upon completion of the course, students will feel more comfortable with computational fluid dynamics work that they might encounter in the future, and have a better appreciation of the complexities of blood flow in the circulation system.



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