BIOENG-312

Fluid mechanics (for SV)

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Cursus	Sem.	Type
Life Sciences Engineering	BA4	Obl.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	Written
Workload	120h
Weeks	14
Hours	**4 weekly**
Lecture	2 weekly
Exercises	2 weekly
Number of positions	

Summary

This introductory course on fluids mechanics presents the basics concepts in fluids statics, dynamics and kinematics. All the concepts required to take the cardiovascular track in the Bioengineering Master program are covered.

Content

1. Introduction. Basic characteristics of fluids.
2. Fluid statics.
3. Elementary fluid dynamics. The Bernoulli equation.
4. Fluid kinematics. The velocity filed. Acceleration field. The Reynolds transport theorem.
5. Control volume analysis. Mass conservation. Momentum and moment-of-momentum equations.
6. Differential analysis of fluid flow. Inviscid flow. Potential flow. Viscous flow. Navier-Stokes equations. Simple solutions to viscous, incompressible flows.
7. Dimensional analysis.
8. Viscous flow in pipes.