Study program / course: Mechanical engineering	
Type and level of study: Master academic studies	
Course: Hydraulic and pneumatic machinery design	
Lecturers: Despotović Z. Milan, Babić J Milun	
Status of course: Obligatory for module M_4, I semester	
Number of ECTS: 6	
Precondition: none	

The objective of course

The objective of the course "Hydraulic and pneumatic machinery design" is to prepare future engineers for optimal designing of hydraulic and pneumatic machinery within the wide range of possible working regimes, and to acquaint future engineers with numerical experiment terminology and with methodology of design based on virtual models.

The outcome of course

Theoretical and practical knowledge about hydraulic and pneumatic machinery design.

Syllabus

Direct and inverse hydraulic and pneumatic machinery design problem, blade modelling, basic design parameters of axial impellers, lift and drag, Hydraulic calculation of a spiral case, Experimental methods of investigation of hydraulic and pneumatic machinery performances, air tunnel, optical measurement techniques (LDA, L2F, PIV, DGV), interferometry, CFD in hydraulic and pneumatic machinery design, methodology, governing equations, discretization grids, discretization methods, finite volume method, boundary conditions, solving methods, methods for accelerating iterative processes, multigrid technique, turbulence modelling, DNS, RANS, LES, flow visualization in hydraulic and pneumatic machinery (post-processing).

Recommended reading

1. M. Babić, S. Stojković: Teorija i principi matematičkog modeliranja turbomašina, Prosveta, Beograd, 1997
2. B. Ristić: Pumpe i ventilatori, Naučna knjiga Beograd, 1987.
3. M. Despotović, skripta u pripremi

The number of hours of active teaching:				Other classes:
Theory: 2	Practical classes: 1.6	Other forms of teaching: 0.4	Research study: 0	1

Methods of teaching

Evaluation of knowledge			
Pre-final exam obligations	**points**	**Final exam**	**points**
Activities during the classes:	**10**	Final exam	**30**
midterm exam(s) :	**30**		
Seminar(s) :	**30**		