MM1441

Study program / course: Mechanical Engineering	
Type and level of study: Master academic studies	
Course: Numerical simulation and optimization	
Lecturers: Jovičić M. Nebojša, Drspotović Z. Milan	
Status of course: Obligatory for module M₄, I semester	
Number of ECTS: 6	
Precondition: Mathematics, Thermodynamics, Fluid Mechanics	

Status of course: Obligatory for module M_4, I semester

The objective of course:
- To introduce students with the basic elements of numerical approach in fluid mechanics and
- Getting skills for conducting of computational simulation and optimization of the real engineering processes in area of energy and process engineering by using commercial software tools.

The outcome of course
After finishing the course students will be able:
- To apply acquiring theoretical knowledge in mathematics, thermodynamics, and fluid mechanics,
- To design complex mathematical models and numerical algorithms for simulation of real-life problems in energy and process engineering,
- To conduct numerical simulations and analyze results obtained,
- To presents competently the results of numerical simulation by using appropriate multimedial tools.

Syllabus
Theoretical study
Introducing lecture. Basics of CFD. Mathematical modeling of physical problems.
Discretisation of physical space. Discretization of mathematical models. Heat conduction.
Convection and diffusion. Fluid flow. Simulation of separation process. Cyclones.
Simulation of turbomachinery fluid flow.

Practical classes
Heat conduction. Convection and diffusion. Fluid flow.
Simulation of separation process. Cyclons. Simulation of turbomachinery fluid flow.

Recommended reading
1. Jovičić N., Modeliranje i simulacija radnih procesa u hidrauličkim turbomašinama, Monografija, Legenda, Čačak, 2005
2. Petrović Z., Stupar S., Projektovanje računarom – metod konačnih razlika, Univerzitet u Beogradu, 1996

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

Methods of teaching

Evaluation of knowledge			
Pre-final exam obligations	**Points**	**Final exam**	**points**
Activities during the classes:	**10**	Final exam	**30**
Practical classes:			
Colloquiums(s) :	**30**		
Project(s) :	**30**		