

Study program / course: Mechanical Engineering				
Type and level of study: Master academic studies				
Course: Hydraulic and pneumatic transport				
Lecturers: Milovanovic M. Dobrica				
Status of course: Elective for module M ₄ , III semester				
Number of ECTS: 6				
Precondition: No				
The objective of course The main course objective is to introduce students with theoretical, constructive and practical principles of hydraulic and pneumatic transport of solids.				
The outcome of course Students should be capable of using different methods for designing of hydraulic and pneumatic transport.				
Syllabus Theoretical study Physical properties of mixtures (particle size, shape and surface roughness, density of powdery materials, density of mixture). Basic parameters of hydraulic and pneumatic transport (porosity, flowrates and material concentrations; sedimentation velocity of particle) Fluidization of powdery materials (phenomenon of fluidization, first and second critical velocity of fluidization, pressure drop) Pneumatic transport (transport of fluidized materials - fluidized bed, fluid lift; single particle and system of particles in gas stream, pressure drop in straight pipes, bends and other parts of installations, equipments for pneumatic transport) Hydraulic transport (classification, homogenous and non-homogenous mixture flow, pressure drop calculation, equipments for hydraulic transport).				
Practical classes Practical training designed to reinforce the syllabus. Seminars.				
Recommended reading 1. Milovanovic, D.: Hidraulični i pneumatski transport, skripta, Mašinski fakultet Kragujevac, 2008. 2. Šašić, M.: Transport fluida i čvrstih materijala cevima, Građevinska knjiga, Beograd, 1990. 3. Milovanović, D.: Transport fluida cevima, zbirka rešenih zadataka, Mašinski fakultet Kragujevac, 1998.				
The number of hours of active teaching:				Other classes: 1
Theory: 3	Practical classes: 1,4	Other forms of teaching: 0,6	Research study: 0	
Methods of teaching Teaching is performed through lectures and auditorium. Knowledge checking is continuous during the year through tests, seminars, discussion on the teaching units. Student's activities are rated during the teaching (70 points) and during the final exam (30 points).				
Evaluation of knowledge				
Pre-final exam obligations	points	Final exam	points	
Activities during the classes:	10	Final exam	30	
Practical classes:				
Colloquiums(s) :	50			
Seminar(s) :	10			