

Course Unit Descriptor

<b>Study Programme:</b> Food Engineering; Biotechnology; Pharmaceutical Engineering; Chemical Engineering; Materials Engineering			
<b>Course Unit Title:</b> Unit Operations 1			
<b>Course Unit Code:</b> O4301			
<b>Name of Lecturer(s):</b> Prof. Branislava Nikolovski, PhD; Assoc. Prof. Marija Radojković, PhD			
<b>Type and Level of Studies:</b> Undergraduate Academic Studies			
<b>Course Status (compulsory/elective):</b> Compulsory			
<b>Semester (winter/summer):</b> Summer			
<b>Language of instruction:</b> English			
<b>Mode of course unit delivery (face-to-face/distance learning):</b> Face-to-face			
<b>Number of ECTS Allocated:</b> 9			
<b>Prerequisites:</b> /			
<b>Course Aims:</b> Training students to understand and apply basic mechanical operations used in the process industry. Training for independent work on semi-indoor level equipment during experimental exercises, which will enable them to easily integrate into the drive process in the process industry.			
<b>Learning Outcomes:</b> The ability to understand and apply knowledge from mechanical operations with independent solving of problems from statics, dynamics and transport of fluid, obstruction, flow of fluid through the porous environment, motion of particles through the fluid, filtration and centrifugation, fluidization, blending and mixing, crushing, screening and transporting solid materials. Ability to prepare relevant and transparent reports on the results of experimental exercises.			
<b>Syllabus:</b> <i>Theory</i> Analogies of transport processes: momentum, heat, and mass. Mechanisms for transferring the amount of movement. Statics, dynamics and transport of fluids. Streaming fluid through a porous medium. Moving particles through the fluid. Filtration and centrifugation. Fluidization. Blending and mixing. Shaking, milling and grinding of solid materials. Transport of solid material. <i>Practice</i> Computational exercises: solving specific calculation problems illustrated by individual components of the lectures. Laboratory exercises: hydrodynamics, transport of fluid, precipitation, filtration and fluidization.			
<b>Required Reading:</b> Coulson, J.M., Richardson, J.F., Backhurst, J.R., Harker, J.H.: Chemical Engineering-Volume Two, Pergamon Press, Oxford, 1983. Geankoplis, C.J.: Transport Processes and Unit Operation, Prentice Hall, Englewood, New Jersey, 1993. McCabe, W., Smith, J., Harriott, P.: Unit Operations Of Chemical Engineering, 7th Ed, McCabe And Smith, McGraw Hill international editions, Chemical Engineering series (2005).			
<b>Weekly Contact Hours:</b> 7		<b>Lectures:</b> 3	<b>Practical work:</b> 4
<b>Teaching Methods:</b> Lectures and students group work			
<b>Knowledge Assessment (maximum of 100 points):</b>			
<b>Pre-exam obligations</b>	points	<b>Final exam</b>	points
Active class participation	5	oral exam	30
Experimental exercises	25		
Test I and Test II	20+20		