

<b>Study program:</b> Mechanical Engineering			
<b>Type and level of studies:</b> Master Studies			
<b>Course unit:</b> Facility layout and material handling system design			
<b>Teacher in charge:</b> Mile Savković			
<b>Language of instruction:</b> English			
<b>ECTS:</b> 6			
<b>Prerequisites:</b> None			
<b>Semester:</b> Winter semester			
<b>Course unit objective:</b> The students will get a systematic gain of the factory design's general knowledge, material handling solutions in the plant, production and transportation equipment layout, and the general guidelines for designing the factory plants under applicable regulations and standards.			
<b>Learning outcomes of the Course unit</b> The students will be trained to design the factory plant with the most efficient equipment placement and material handling solutions.			
<b>Course unit contents</b> <i>Theoretical classes</i> Technical and other requirements. Previous analyses. The scope, method of preparation and content of the project study. The choice of the factory location. Design of the factory layout. Production capacity. Factory plant subsystems. Factory workshops classification. Material handling. Walking paths. Types of factory buildings. Program production. The volume of production. Design layout and technical capacity. Subsystems factory. The division and classification workshop. Movement of materials. Pedestrian walkways. The relation between factory internal transport and layout of equipment. The types of factory internal transport systems. Determination of the system capacity. Criteria for the selection of the transport system. Methods for analyzing the movement of materials. Data acquisition for the analysis of material movement. Queuing theory. Basic models of the queuing theory. The main types of production. Interaction between the production process and internal transport. Determining the level of automation. The design procedure. Determination of required equipment and employee sites according to production capacity. Calculation of the required area. The basic principles of the layout of equipment and operators. Final factory layout design. <i>Practical classes</i> Practical classes consist of presentations on factory plant solutions.			
<b>Literature</b> James A. Tompkins, John A. White, Yavuz A. Bozer, J. M. A. Tanchoco, Facilities Planning, John Wiley & Sons, 2010. Chandrashekar Hiregoudar, Facility Planning And Layout Design, Technical Publications, 2007.			
<b>Number of active teaching hours</b>			<b>Other classes</b>
Lectures: 3	Practice: 1	Other forms of classes: 1	Independent work:
<b>Teaching methods</b> Theoretical classes are in the form of lectures carried out in the classroom. The exercises are performed in the classroom and computer laboratory through factory design software.			
<b>Examination methods ( maximum 100 points)</b>			
<b>Exam prerequisites</b>	<b>No. of points:</b>	<b>Final exam</b>	<b>No. of points:</b>
Student's activity during lectures	10	oral examination	
practical classes/tests	30	written examination	30
Seminars/homework		.....	
Project	30		
Other			
<b>Grading system</b>			
<b>Grade</b>	<b>No. of points</b>	<b>Description</b>	
<b>10</b>	<b>91-100</b>	Excellent	
<b>9</b>	<b>81-90</b>	Exceptionally good	
<b>8</b>	<b>71-80</b>	Very good	
<b>7</b>	<b>61-70</b>	Good	
<b>6</b>	<b>51-60</b>	Passing	
<b>5</b>	<b>Less than 50</b>	Failing	