

**MM3212**

<b>Study program / course: Mechanical Engineering</b>				
<b>Type and level of study: Master academic studies</b>				
<b>Course: Technologies of surfaces modification and regeneration</b>				
<b>Lecturers: Vasiljević S. Bogdan, Lazić N. Vukić</b>				
<b>Status of course: Elective for module M<sub>1</sub>, III semester</b>				
<b>Number of ECTS: 6</b>				
<b>Prerequisite: None</b>				
<b>The course objective:</b> Mastering knowledge from the area of the surfaces modification and regeneration of various parts of machine systems, which are in operation subjected to tribological and other influences. This assumes acquiring the necessary knowledge for independent selection of the most favorable technology and technological parameters, where the numerous techno-economic advantages are being realized. By application of the modern technologies, the exploitational properties of the working surfaces are being improved, what point to justification of introducing the new procedures in the area of surfaces modification and regeneration.				
<b>The course outcome:</b> After passing the final exam, students will be able to be successfully involved in scientific research in this important, yet not sufficiently investigated area.				
<b>Syllabus</b>				
<b>Theoretical study:</b> Notion and importance of engineering surfaces modification and regeneration, development and application of the new technologies and procedures in the vacuum, plasma-ion and laser technology. Methods of coatings deposition to the substrate and methods of modification of the substrate material properties in the surface layers. Notion and structure of the surface layers, their characteristics. Topography and surface topography parameters. Contact surfaces. Hard-facing procedures review. Gas hard-facing. Arc and other types of hard-facing. Basic principles in selection of the materials for welding, hard-facing and coating.				
<b>Practical studies:</b> Laboratory and practical; work. Same areas as for lecturing.				
<b>Recommended reading</b>				
<ol style="list-style-type: none"> <li>1. B. Vasiljević, B. Nedić, Modification of surfaces - basic technologies of modification, Faculty of Mechanical Engineering, Kragujevac, 2003 (In Serbian).</li> <li>2. V. Lazić, Surfaces regeneration, Monograph, Faculty of Mechanical Engineering, Kragujevac, 2006. (In Serbian).</li> <li>3. Jovanović, M., Adamović, D. and Lazić, V., Technology of Welding – A Handbook, Kragujevac, 1996. (In Serbian).</li> </ol>				
The number of hours of active teaching:				Other classes:
Theory: 45	Practical classes: 21	Other forms of teaching: 8	Research study:	1
<b>Methods of teaching</b>				
<b>Evaluation of knowledge</b>				
<b>Pre-final exam obligations</b>	<b>Points</b>	<b>Final exam</b>	<b>Points</b>	
Activities during the classes:	<b>5</b>	Oral exam	<b>30</b>	
Practical classes:	<b>25</b>			
Colloquium (a):	<b>40</b>			