

14. Surface Protection

GENERAL INFORMATION ABOUT THE COURSE		
Course coordinator	Ivan Samardžić, PhD, professor	
Course name	Surface Protection	
Study program	Mechanical Engineering	
Course status	Compulsory	
Year	1	
Semester	1	
Number of credits and teaching methods	ECTS student load coefficient	5
	Number of hours (lectures + seminars + exercises)	30+10+20

1. DESCRIPTION OF THE COURSE
1.1. Course objectives
Surface Protection exams corrosion and corrosion protection. Literature also calls this scientific area corrosion protection technology, material protection or corrosion technology. The Surface Protection course provides the foundation for better understanding the underlying mechanisms of corrosive action of surroundings on structural materials. A better knowledge of corrosive properties of metals enables engineers to select optimal technological solutions in constructing equipment. The Surface Protection course thoroughly elaborates corrosion mechanisms with the aim of understanding corrosive properties of materials and their behaviour in various corrosive environments.
1.2. Course enrolment prerequisites (<i>if applicable</i>)
1.3. Expected course learning outcomes
<ol style="list-style-type: none"> 1. Explain corrosion and protection of materials 2. Select protection coatings 3. Analyse mechanism of corrosive action of mediums on metals 4. Describe metal protection using coating, changes in the environment

1.4. Course content							
<ol style="list-style-type: none"> 1. Introduction to surface protection technologies 2. Theory of chemical corrosion of metals 3. Theory of electrochemical corrosion of metals 4. Phase stability diagrams in corrosion processes 5. Corrosion testing 6. Laboratory, field and exploitation testing of corrosion 7. Corrosion behaviour and selecting materials 8. Corrosion behaviour of metals 9. Corrosion behaviour of non-metals 10. Protecting metals against corrosion 11. Cathode protection and inhibitors of corrosion 12. Structural solutions with respect to corrosion 13. Preparing material surfaces 14. Metal protection technologies 15. Standards and laws 							
1.5. Types of teaching		<input checked="" type="checkbox"/> Lectures <input type="checkbox"/> Seminars and workshops <input checked="" type="checkbox"/> Exercises <input type="checkbox"/> Distance learning <input checked="" type="checkbox"/> Field work			<input type="checkbox"/> Autonomous exercises <input type="checkbox"/> Multimedia and network <input checked="" type="checkbox"/> Laboratory <input type="checkbox"/> Mentor assistance <input type="checkbox"/> Other types		
1.6. Comments							
1.7. Student obligations (<i>attendance at classes, lectures, tutorials, seminars</i>)							
Attendance at classes and (laboratory) exercises.							
1.8. Tracking student work (proportion of individual activities in terms of ECTS credits based on the total number of ECTS credits)							
Class attendance	2	Class participation		Seminar paper		Experimental work	
Written exam	2	Oral exam	1	Essay		Research	
Project		Continual assessment of knowledge		Written seminar paper		Practical work	
Online activity							
1.9. Grading and assessment of student work during the semester and for the final exam (<i>inter exam, written exam, oral exam</i>)							
Written and oral exam.							

1.10. Mandatory literature (relevant at the time of submitting the proposed study program)			
1. I. Esih, Z. Dugi: Tehnologija zaštite od korozije I i II, Zagreb, 1990.			
2. I. Esih, Osnove površinske zaštite, Zagreb 2003.			
1.11. Supplementary literature (relevant at the time of submitting the proposed study program)			
1. P.R. Roberge: Handbook of corrosion engineering, McGraw Hill, new York, 1999.			
2. D.A. Jones: principles and prevention of corrosion, Prentice Hall, New York, 1996.			
3. I. Esih, Z.Dugi: Tehnologija zaštite od korozije I i II. FSB, Zagreb.			
1.12. Manner of tracking quality to ensure the acquisition of exit knowledge, skills and competences			
2. COMBINING THE LEARNING OUTCOMES, TEACHING METHODS AND ASSESSMENT OF THE LEARNING OUTCOMES			
<i>2.1. Class participation</i>	<i>2.2. Student participation</i>	<i>2.3. Learning outcome</i>	<i>2.4. Assessment method</i>
Attendance of lectures, (laboratory) exercises	Presence at classes	1-4	Records
Continual assessment of knowledge	Preparations for interim exam or written exam	1-4	Interim exam or written exam
Final exam	Reviewing adopted course content	1-4	Oral exam