



University of Split

Department of Professional Studies

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# **FUNDAMENTALS OF MECHATRONICS**

## **COURSE SYLLABUS**

COURSE DETAILS		
<i>Type of study programme</i>	Professional study - 180 ECTS	
<i>Study programme</i>	CONSTRUCTION MECHANICAL ENGINEERING	
<i>Course title</i>	FUNDAMENTALS OF MECHATRONICS	
<i>Course code</i>	SKS031	
<i>ECTS (Number of credits allocated)</i>	5	
<i>Course status</i>	Core	
<i>Year of study</i>	Third	
<i>Semester</i>	Fifth (fall)	
<i>Course Web site</i>	<a href="http://www.oss.unist.hr/">http://www.oss.unist.hr/</a>	
<i>Total lesson hours per semester</i>	Lectures	30
	Practices	00
	Laboratory exercises & practical demonstration	30
<i>Prerequisite(s)</i>	None	
<i>Lecturer(s)</i>	Department of Electrical Engineering faculty: Predrag Đukić, Ph.D., College professor,	
<i>Language of instruction</i>	Croatian, English	

COURSE DESCRIPTION	
<i>Course Objectives:</i>	<ul style="list-style-type: none"> <li>• understanding basic laws and phenomena in the area of Mechatronics- energy transformation in sensors and actuators: Electrodynamic, piezoelectric, electrostatic and magnetostrictive</li> <li>• theoretical and practical preparation of students to acquire and apply knowledge and skills in mechatronics</li> <li>• Conducting experiments in laboratory and industrial environment</li> </ul>
<i>Learning outcomes</i>  <i>On successful completion of this course, student should be able to:</i>	<ol style="list-style-type: none"> <li>1. explain fundamental physical and technical base of Mechatronic systems,</li> <li>2. describe basic laws and phenomena that define behaviour of mechatronic systems,</li> <li>3. analyse various premises, approaches procedures and results related to mechatronic systems,</li> <li>4. Create analytical, design and development solutions for components, devices and equipment of mechatronic systems,</li> <li>5. conduct experiments and measurements in laboratory and on real components, devices and equipment of control systems,</li> <li>6. interpret acquired data and measured results,</li> <li>7. describe development and application of mechatronic systems</li> <li>8. take a part in team work and be able to independently present various professional materials</li> </ol>
<i>Course content</i>	<p>Elements of interface between mechanical and electric/electronic components and devices.</p> <p>Circuits for supply/actuation of electromechanical actuators ( content adjusted for Mech. Eng. Students)</p> <p>Circuits for data conditioning of electromechanical sensors, AD-DA conversion ( content adjusted for Mech. Eng. Students)</p> <p>Sensors of physical values.</p>

## CONSTRUCTIVE ALIGNMENT – Learning outcomes, teaching and assessment methods

Alignment of students activities with learning outcomes		
Activity	Student workload ECTS credits	Learning outcomes
<i>Lectures</i>	30 hours/ 1 ECTS	1,2,3,4,5,6,7,8
<i>Practicals</i>	00 hours/ 0 ECTS	
<i>Laboratory work</i>	30 hours/ 1 ECTS	4,5,6,8
<i>Preparation, laboratory mid-term exam</i>	15 hours/ 0,5 ECTS	4,5,6,8
<i>Practical demonstration</i>	15 hours/ 0,5 ECTS	
<i>Three mid-term exams (preparation and delivery)</i>		
<i>Self-study</i>	45 hours/ 1,5 ECTS	1,2,3,4,5,6,7,8
<i>Office hours and final exam</i>	15 hours/ 0,5 ECTS	
<b>TOTAL:</b>	<b>150 hours / 5 ECTS</b>	<b>1,2,3,4,5,6,7,8</b>

CONTINUOUS ASSESSMENT		
Continuous testing indicators	Performance $A_i$ (%)	Grade ratio $k_i$ (%)
<i>Class attendance and participation</i>	70 - 100	0,1
<i>Laboratory work</i>	100	0,25
<i>Laboratory mid-term exam</i>	50-100	0,25
<i>First mid-term exam</i>	50-100	0,15
<i>Second mid-term exam</i>	50-100	0,15
<i>Third mid-term exam</i>	50-100	0,15

FINAL ASSESSMENT		
Testing indicators – final exam (first and second exam term)	Performance $A_i$ (%)	Grade ratio $k_i$ (%)
<i>Practical exam (written)</i>	<b>50 - 100</b>	<b>40</b>
<i>Theoretical exam (written and/or oral)</i>	<b>50 - 100</b>	<b>50</b>
<i>Previous activities (include all continuous testing indicators)</i>	<b>50 - 100</b>	<b>10</b>
Testing indicators – makeup exam (third and fourth exam term)	Performance $A_i$ (%)	Grade ratio $k_i$ (%)
<i>Practical exam (written)</i>	<b>50 - 100</b>	<b>50</b>
<i>Theoretical exam (written and/or oral)</i>	<b>50 - 100</b>	<b>50</b>

PERFORMANCE AND GRADE		
Percentage	Criteria	Grade
<b>50% - 61%</b>	<i>basic criteria met</i>	<b>sufficient (2)</b>
<b>62% - 74%</b>	<i>average performance with some errors</i>	<b>good (3)</b>
<b>75% - 87%</b>	<i>above average performance with minor errors</i>	<b>very good (4)</b>
<b>88% - 100%</b>	<i>outstanding performance</i>	<b>outstanding (5)</b>

### ADDITIONAL INFORMATION

Teaching materials for students (scripts, exercise collections, examples of solved exercises), teaching record, detailed course syllabus, application of e-learning, current information and all other data are available by MOODLE system to all students.