

Study program : Chemistry			
Type and level of studies: Doctor academic studies			
<b>Course unit: The application of organometallic compounds in synthetic chemistry</b>			
<b>Teacher in charge : Professor Dr Zoran Ratković</b>			
Language of instruction: <i>English</i>			
ECTS: 10			
Prerequisites: Student of doctor academic studies			
Semester: <i>Summer Semester</i>			
<b>Course unit objective</b>			
Throughout the teaching that takes place during the course, students will first be introduced to the concept and types of organometallic compounds and the historical development of this field of chemistry. Modern approach to organometallic chemistry includes knowledge of various forms of structural isomerism, calculation of the available electrons and "18-electron rule". This rule forms the basis for understanding modern organometallic chemistry. During this course, students will learn about the ligands and their electronic structure and characteristic interactions in organometallic compounds. Become familiar with substitution reactions, exchange reactions and nucleophilic and /or electrophilic attack to coordinated ligands for these compounds.			
This course will cover the basic application of organometallic compounds in catalytic or stoichiometric quantities in laboratories or industry, as well as some industrial processes in organic synthesis.			
<b>Learning outcomes of Course unit</b>			
Students will be able to synthesize organometallic compounds and apply them in organic synthesis of various materials. It is necessary to take into account all relevant factors, ranging from the availability of the starting materials to the purity of the product and economic indicators.			
<b>Course unit contents</b>			
Organometallic compounds: concept and historical overview (discovery of certain organometallic compounds and processes in which they participate). Energy, polarity and reactivity of metal-carbon bonds. Classification of organometallic compounds. Features and reactions of organometallic compounds of main group elements. Organometallic compounds of the group of transition elements; Rule of 18 valence electrons and types of ligands. Synthesis, structure and chemical reactions of organometallic compounds. The catalytic applications of organometallic synthetic derivatives; some industrial processes with organometallic compounds.			
<b>Literature</b>			
1. A. Togni, T. Hayashi: <i>Ferrocenes: Homogeneous Catalysis/Organic Synthesis/Materials Science</i> , Wiley-VCH Verlag GmbH, 1995			
2. G. O. Spessard, G. L. Miessler, <i>Organometallic Chemistry</i> , Prentice Hall, 1997.			
<b>Number of active teaching hours</b>			<b>Other classes</b>
Lectures: 5	Practice: 0	Other forms of classes: Independent work:	
<b>Teaching methods</b>			
Lectures, seminars and practical classes.			
<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	<b>20</b>	oral examination	<b>25</b>
practical classes/tests		written examination	<b>25</b>
Seminars/homework	<b>30</b>	.....	
Project			
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>0-50</b>	Failing

**(Table 5.2) Course unit description**