

<b>Course code</b>																																	
<b>Type and description</b>	EC																																
<b>ECTS credit</b>	1																																
<b>Course name</b>	Advanced Materials for Printed Electronics																																
<b>Course name in Polish</b>	Zaawansowane materiały do zastosowań w elektronice drukowanej																																
<b>Language of instruction</b>	English																																
<b>Course level</b>	8 PRK																																
<b>Course coordinator</b>	Beata Łuszczynska																																
<b>Course instructors</b>	Beata Łuszczynska																																
<b>Delivery methods and course duration</b>	<table border="1"> <thead> <tr> <th></th> <th>Lecture</th> <th>Tutorials</th> <th>Laboratory</th> <th>Project</th> <th>Seminar</th> <th>Other</th> <th>Total of teaching hours during semester</th> </tr> </thead> <tbody> <tr> <td>Contact hours</td> <td>0</td> <td>0</td> <td>0</td> <td>15</td> <td></td> <td>0</td> <td>15</td> </tr> <tr> <td>E-learning</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td></td> </tr> <tr> <td>Assessment criteria (weightage)</td> <td>0,00</td> <td></td> <td></td> <td></td> <td></td> <td>0,00</td> <td></td> </tr> </tbody> </table>		Lecture	Tutorials	Laboratory	Project	Seminar	Other	Total of teaching hours during semester	Contact hours	0	0	0	15		0	15	E-learning	No	No	No	No	No	No		Assessment criteria (weightage)	0,00					0,00	
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<b>Course objective</b>	<p>The aim of the course is to enable students to acquire knowledge in the field of:</p> <ol style="list-style-type: none"> <li>1. Organic semiconductors used in electronics,</li> <li>3. Types of organic electronic devices which are used in displays and photovoltaic systems</li> <li>3. Printing techniques and the principles of selecting components for printing inks and printing mixtures in terms of their application in a given printing technique</li> </ol>																																
<b>Learning outcomes</b>	<p>After the course a PhD student is able to:</p> <ol style="list-style-type: none"> <li>1. list the known printing techniques which are used in electronic sector – effect W4,</li> <li>2. list the requirements for materials as components of mixtures prepared for printing with the use of the proposed printing technique – effect W4,</li> <li>3. have knowledge related to the physico-chemical processes occurring during the deposition of materials by means of known printing techniques – effect W4, U4, K1</li> <li>3. indicate the development prospects and limitations of known printing techniques used to obtain two-dimensional and three-dimensional elements – effects W4, U4, K1,</li> <li>4. define the directions and priorities of the necessary further learning on the basis of acquired knowledge in the field of printing techniques – effects W4, U4, K1.</li> </ol>																																
<b>Assessment methods</b>	<p>Effects W4, U4, K1</p> <p>– oral presentation of individual project presenting the use of the printing methods in own experiment.</p> <p>The final evaluation is based on:</p> <p>Presentation - 100%</p>																																
<b>Prerequisites</b>	Master degree course in physics or chemistry																																
<b>Course content with delivery methods</b>	<b>The lecture covers the following topics:</b>																																

	<p>-Printing techniques used to obtain 2D using functional materials and semiconductors</p> <p>-Principle of operation and construction of printed optoelectronic devices</p> <p><b>The project covers the following topics:</b></p> <p>-Printing techniques: screen printing, inkjet, aerosol printing, 3-D printing</p> <p>-Functional materials and their modification for use in various printing techniques. --</p> <p>-Problems in compositions of mixtures for printing, principles of selecting components in inks and printing mixtures (the problem of selecting solvents in inkjet compositions, the problem of orthogonal solvents)</p>
<b>Basic reference materials</b>	Materials from lectures
<b>Other reference materials</b>	<p>1."Fundamentals of Inkjet Printing", S.D.Hoath, Wiley, 2016</p> <p>2. "Solution-Processable Components for Organic Electronic Devices, B.Luszczynska, K. Matyjaszewski, J. Ulanski, Wiley, 2019</p>
<b>Average student workload outside classroom</b>	10 h
<b>Comments</b>	
<b>Last update</b>	02.03.2023