<table>
<tr><td>Course code</td><td></td></tr>
<tr><td>Type and description</td><td>EC</td></tr>
<tr><td>ECTS credit</td><td>1</td></tr>
<tr><td>Course name</td><td>Advanced Materials for Printed Electronics</td></tr>
<tr><td>Course name in Polish</td><td>Zaawansowane materiały do zastosowań w elektronice drukowanej</td></tr>
<tr><td>Language of instruction</td><td>English</td></tr>
<tr><td>Course level</td><td>8 PRK</td></tr>
<tr><td>Course coordinator</td><td>Beata Łuszczyńska</td></tr>
<tr><td>Course instructors</td><td>Beata Łuszczyńska</td></tr>
<tr><td>Delivery methods and course duration</td><td>
<table>
<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>
<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>
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<tr><td>Course objective</td><td>The aim of the course is to enable students to acquire knowledge in the field of:
1. Organic semiconductors used in electronics,
3. Types of organic electronic devices which are used in displays and photovoltaic systems
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</td></tr>
<tr><td>Learning outcomes</td><td>After the course a PhD student is able to:

1. list the known printing techniques which are used in electronic sector – effect W4, 2. list the requirements for materials as components of mixtures prepared for printing with the use of the proposed printing technique – effect W4, 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 3. indicate the development prospects and limitations of known printing techniques used to obtain two-dimensional and three-dimensional elements – effects W4, U4, K1, 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.</td></tr>
<tr><td>Assessment methods</td><td>Effects W4, U4, K1

– oral presentation of individual project presenting the use of the printing methods in own experiment.

The final evaluation is based on:

Presentation - 100%</td></tr>
<tr><td>Prerequisites</td><td>Master degree course in physics or chemistry</td></tr>
<tr><td>Course content with delivery methods</td><td>The lecture covers the following topics:</td></tr>
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	-Printing techniques used to obtain 2D using functional materials and semiconductors -Principle of operation and construction of printed optoelectronic devices **The project covers the following topics:** -Printing techniques: screen printing, inkjet, aerosol printing, 3-D printing -Functional materials and their modification for use in various printing techniques. -- -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)
Basic reference materials	Materials from lectures
Other reference materials	1.”Fundamentals of Inkjet Printing”, S.D.Hoath, Wiley, 2016 2. “Solution-Processable Components for Organic Electronic Devices, B.Luszczynska, K. Matyjaszewski, J. Ulanski, Wiley, 2019
Average student workload outside classroom	10 h
Comments	
Last update	02.03.2023