<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>Principles of polymer materials characterization</td></tr>
<tr><td>Course name in Polish</td><td>Podstawy charakterystyki materiałów polimerowych</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>Dr hab. inż. Joanna Pietrasik, prof. uczelni</td></tr>
<tr><td>Course instructors</td><td>Dr hab. inż. Magdalena Maciejewska, prof. uczelni, dr hab. inż. Joanna Pietrasik, prof. uczelni</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>0,00</td><td>0,00</td><td>100%</td><td>0,00</td><td>0,00</td><td>100%</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 methods used to analyze advanced polymers and polymer composites, including polymers with nonlinear chain architecture. Particular attention is focused on thermal and chromatographic methods.</td></tr>
<tr><td>Learning outcomes</td><td>After the course a PhD student is able to:

1. identify problems in testing the properties of polymer materials – effects W4, U4, K1

2. justify the selection of the appropriate method and the conditions for the analysis of different polymer materials – effect W4, U4, K1

3. use complementary different analytical methods to identify polymers, determine the qualitative and quantitative composition of polymer composites – effects W4, U4, K1</td></tr>
<tr><td>Assessment methods</td><td>Effects W4, U4, K1 – presentation

The final grade consists of:
Project preparation, description and oral presentation - 100%</td></tr>
<tr><td>Prerequisites</td><td>polymer chemistry and physics</td></tr>
<tr><td>Course content with delivery methods</td><td>Types of chromatography. Configuration of the system for polymer analysis. Thermodynamics of solutions and molecular weight. Oligomers, (co) polymers, macromolecules with complex architecture.

Phase transitions, physical states and thermal stability of polymers. Methods of thermal analysis used for studying phase transitions, composition, thermal properties and viscoelastic behavior of polymers and their composites. Kinetics of crosslinking and resistance to thermo-oxidation of polymers studied with thermal analysis.</td></tr>
<tr><td>Basic reference materials</td><td>1. Sperling L.H. Introduction to Physical Polymer Science. Wiley & Sons, 2006.
2. 2. Cheng S.Z.D. Handbook of Thermal Analysis and Calorimetry, vol. 3. Application to Polymers and Plastics. Elsevier Science B.V., Amsterdam, 2002.
3. Wunderlich B. Thermal Analysis of Polymeric Materials. Springer, Berlin, 2005.</td></tr>
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Other reference materials	1. Wagner M. Thermal Analysis in Practice. Collected Applications. Mettler Toledo, Schwerzenbach, 2009. 2. Przygocki W. Metody fizyczne badań polimerów, PWN, Warszawa,1990
Average student workload outside classroom	15 h
Comments	
Last update	March 2023