

Course code																																	
Type and description	Elective Course																																
ECTS credit	1																																
Course name	Supercritical Fluid Applications																																
Course name in Polish	Zastosowania płynów nadkrytycznych																																
Language of instruction	English																																
Course level	8 PRK																																
Course coordinator	Dr hab. inż. Paweł Wawrzyniak, prof. PŁ																																
Course instructors	Dr hab. inż. Paweł Wawrzyniak, prof. PŁ																																
Delivery methods and course duration	<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>0</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	0	15	E-learning	No	No	No	No	No	No		Assessment criteria (weightage)	0,00					0,00	
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Course objective	Acquiring knowledge and skills in the field of supercritical fluids application.																																
Learning outcomes	<p>Having completed the course student can:</p> <ol style="list-style-type: none"> 1. Characterize the properties of supercritical fluids and the potential for their use in separating components of mixtures. Know methods for designing basic unit processes using supercritical fluids. W4, U4,K1 2. Evaluate the suitability of a process for a technical task and estimate its performance and cost. . W4, K1 3. Apply knowledge to develop process design assumptions. U4, K1 																																
Assessment methods	<p>W4 – discussion</p> <p>U4, K1 – project seminar presentation</p> <p>W4, U4 – written project</p> <p>The final grade:</p> <p>Presentation - 60%</p> <p>Discussion - 20%</p> <p>Project evaluation - 20%</p>																																
Prerequisites																																	
Course content with delivery methods	<p>LECTURE</p> <ol style="list-style-type: none"> 1. Supercritical Fluids as solvent media in extraction process. 2. Solubility and phase equilibrium. 																																

	<p>3. Extraction processes. Extraction of solids and liquids using dense gases.</p> <p>4. Nanoparticles, nanostructured composite microparticles.</p> <p>PROJECT</p> <p>5. Separation of mixtures by supercritical extraction. Formulating objective of process, selection of process parameters, analysis of solubility, elaboration and interpretation of the results.</p>
Basic reference materials	<p>1. Supercritical Fluids Fundamentals and Applications. Erdogan Kiran, Pablo G. Debenedetti, Cor J. Peters, Springer; 2000th edition (May 31, 2000)</p> <p>2. Supercritical Fluid Extraction: Principles and Practice. Butterworth-Heinemann Ltd; Ed. 2. (1994)</p> <p>3. Sigmund F. Zakrzewski, <i>Environmental Toxicology, Third Edition</i>, OXFORD UNIVERSITY PRESS, (2002).</p>
Other reference materials	<p>1. Brunner, G. (2010). Applications of supercritical fluids. <i>Annual Review of Chemical and Biomolecular Engineering</i>, 1: 321-342..</p> <p>2. García-González, C., Argemí, A., de Sousa, A. S., Duarte, C., Saurina, J., Domingo, C. (2010). Encapsulation efficiency of solid lipid hybrid particles prepared using the PGSS® technique and loaded with different polarity active agents. <i>The Journal of Supercritical Fluids</i>, 54: 342–347.</p> <p>3. Mendes, R. L. (2007). Supercritical fluid extraction of active compounds from algae. <i>Supercritical Fluid Extraction of Nutraceuticals and Bioactive Compounds</i>. CRC Press, Boca Raton, 189–213</p> <p>4. Sovová, H., Opletal, L., Bártlová, M., Sajfřtová, M., Křenková, M. (2007). Supercritical fluid extraction of lignans and cinnamic acid from <i>Schisandra chinensis</i>. <i>The Journal of Supercritical Fluids</i>, 42: 88–95.</p> <p>1. E. Rój, <i>Supercritical Fluid Applications (2017)</i>. New Chemical Syntheses Institute, Pulawy</p>
Average student workload outside classroom	10h
Comments	
Last update	27.04.2023