


5 credits

30.0 h + 22.5 h

Q1

Teacher(s)	Leysens Tom ;Luis Alconero Patricia ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	Crystallization/precipitation techniques Other fluid-solid separation techniques (decantation, centrifugation, filtration including membrane filtration). Operating principles and methods for the selection, sizing and choice of equipment applicable to these unit operations.
Aims	<p><b>Contribution of the activity to the AA (Learning outcomes) referential :</b></p> <ul style="list-style-type: none"> <li>• LO 1 : 1.1</li> <li>• LO 2 : 2.1, 2.2, 2.3</li> <li>• LO 3 : 3.1</li> <li>1 • LO 4 : 4.1, 4.2</li> <li>• LO 5 : 5.1, 5.2, 5.3, 5.4, 5.6</li> </ul> <p><b>At the end of this course, the student will be able to :</b></p> <p>Understand the theoretical bases and practically apply the operating principles, as well as the selection, sizing and equipment choice methods applicable to unit operations for solid-fluid separation.</p> <p>-----</p> <p><i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i></p>
Evaluation methods	Written exam (75%) Exercices notebook (25%)
Teaching methods	1. Crystallization : In 4 lectures of 2 hours by the course teachers. 2. Other fluid-solid separation techniques : In 11 lectures of 2 hours by the course teachers. Flipped classrooms will be organised to address the application of techniques and exercises.
Content	1. Crystal Engineering, crystal growth and crystallization processes (Tom L.) 2. Characterization of particles suspended in liquids. Efficiency of separation (Patricia L.) 3. Coagulation-flocculation, Gravity clarification, Hydrocyclones, Centrifugal sedimentation (Patricia L.) 4. Filtration, pressure filtration, vacuum filtration, centrifugal filtration (Patricia L.) 5. Pressure-driven membrane systems: MF, UF, NF, RO (Patricia L.) 6. Practical exercises (examples of application): Domestic and industrial wastes, the chemical industry, petroleum industry, food industry, sugar industry, brewing, paper industry, paint industry, etc
Inline resources	<a href="https://moodleucl.uclouvain.be/course/view.php?id= 5863">https://moodleucl.uclouvain.be/course/view.php?id= 5863</a>
Bibliography	1. Copie des supports de présentation. Ces documents sont disponibles sur Moodle. 2. Livres de référence : <ul style="list-style-type: none"> <li>• Separation Process Principles, Third Edition, Henley, Seader and Roper, Editor John Wiley &amp; Sons, 2011, ISBN-13: 978-0470646113..</li> <li>• Solid-Liquid Filtration and Separation Technology, Second Edition, A. Rushton, A. Ward, R. Holdich, Editor Wiley VCH, 2000, ISBN-13 978-3527296040</li> <li>• Solid/ Liquid Separation: Principles of Industrial Filtration, 1st Edition, S. Tarleton, R. Wakeman, Editor Elsevier Science,2005 , ISBN-13 978-1856174190</li> <li>• Solid-Liquid Separation 4th Edition Authors: Ladislav Svarovsky eBook ISBN: 9780080541440 Hardcover ISBN: 9780750645683 Imprint: Butterworth-Heinemann Published Date: 31st October 2000</li> </ul>
Other infos	It is highly recommended to have attended Thermodynamics - Phase equilibrium course [LMAPR 1310] or similar
Faculty or entity in charge	FYKI

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Biomedical Engineering	GBIO2M	5		
Master [120] in Chemical and Materials Engineering	KIMA2M	5		