

Course Title:	<b>Separation processes in the petroleum and petrochemical industry</b>
Lecturer:	Prof. Aleksandra Sander, Ph.D.
Course Type	Compulsory
ECTS:	6
Total Hours:	30 hours
Content of the Course:	Principles of mass and heat transfer and their application in various separation processes present in the petroleum and petrochemical industry, including distillation processes, liquid extraction and absorption. The basics of process scale-up.
Competences:	Upon completion of the course the students will be able to: <ul style="list-style-type: none"> <li>• Determine basic principles of mass and heat transfer applied to appropriate processes in the petroleum and petrochemical industry,</li> <li>• Explain the basics of distillation process, absorption and liquid extraction,</li> <li>• Explain the operation of distillation columns, absorbers and extractors and the impact of working conditions,</li> <li>• Analyse processes numerically and graphically.</li> </ul>
Teaching Methodology:	Lectures, seminars
Course Units:	<p>The basics of interphase mass transfer. Vapour-liquid and liquid-liquid phase equilibria. The basics of distillation processes; Mass and heat balances; Distillation columns; Column internals (trays, fillers).  Number of theoretical plates; Graphical methods of determining the number of theoretical plates; Height of a theoretical plate.  The basics of absorption processes; Selection of appropriate selective solvent. Equilibrium and kinetic equations; Dimensioning of absorbers.  The basics of extraction processes; Selection of selective solvent; Partially miscible and immiscible systems; Equilibrium and kinetic equations.  Extractors.  Application of the rules of thumb.  Scale-up of results.  Energy and environmental aspects; Energy savings; Environmentally-friendly solvents.</p>
Examination method:	Written and oral exams
References:	<ol style="list-style-type: none"> <li>1. K. Sattler, H.J. Feindt, Thermal Separation Processes – Principles and Design, 3<sup>rd</sup> ed. VCH, Weinheim, 2008.</li> <li>2. J.D. Seader, E.J. Henley, Separation Process Principles, John Wiley &amp; Sons, Inc., Danvers, 2006.</li> <li>3. J.R. Couper, W.R. Penney, J.R. Fair, S.M. Walas, Chemical Process Equipment: Selection and Design, Elsevier Inc., Burlington, 2005.</li> <li>4. M. Zlokarnik, Scale-up in Chemical Engineering, (2nd Edition), Wiley VCH, Verlag GmbH &amp; Co. KGaA 2006.</li> <li>5. C. Branan, Rules of Thumb for Chemical Engineers, Elsevier Inc., Burlington, 2005.</li> </ol>
Course in English:	Yes
Quality Monitoring Method:	Course quality and performance monitoring in accordance with the quality management system of the University of Zagreb. Self-evaluation of lecturers and student poll.