



SELECTIVE SEPARATION OF STRATEGIC ELEMENTS

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Work load: 60h Theory (lectures), 90h Self-studies.

Number of credits: 5 ECTS

Course code: SSSE. MA. Nr. 3653 / Examination number: 43112

► *Course contents:*

- membranes, modules, hybrid processes
- driving forces, transport resistances
- structures, materials
- mass transfer
- module construction
- MF, UF, NF, RO
- standard applications
- scaling, fouling effects
- special applications: mine water treatment, leaching solutions,
- resource recovery
- internship to membrane processes.

► *Intended Learning Outcomes:*

On completion of the course the student shall be able to explain membrane technology and the different applications like extraction and membrane assisted processes regarding the separation of value products. Focus is put on strategic elements. They can use their physicochemical knowledge on membrane separation, development of hybrid operation systems and the influences for practical applications and are familiar with the methods and problems related to separation devices. Due to the seminar the students will be able to discuss the current literature on the topic.

► *Planned learning activities and teaching methods:*

S1 (WS): Lectures (2 SWS)

S1 (WS): Seminar (1 SWS)

S1 (WS): Practical Application (1 SWS)



▶ *Mode of delivery (face-to-face; distance-learning):*

- Theoretical courses are given by modules of 2 hours.
- Face-to-face discussions with young researchers in the field. Supportive learning during practical lessons by working on datasets both in group and individually.

▶ *Recommended or required readings:*

Heinrich Strathmann: Introduction to Membrane Science and Technology, Wiley-VCH, 2011

Anil K. Pabby, Syed S.H. Rizvi, Ana Maria Sastre Requena: Handbook of Membrane Separations, CRC-Press 2008

▶ *Assessment methods and criteria:*

For the award of credit points it is necessary to pass the module exam.

The module exam contains: KA [90 min]

The Grade is generated from the examination result(s) with the following weights (w): KA [w: 1]

▶ *Contribution to EIT's Overarching Learning Outcomes:*

(EIT OLO5 and OLO6): using physico-chemical knowledge on membrane separation, development of hybrid operation systems and influences for practical applications. The students will be able to explain membrane technology and different applications regarding the separation of value products.