Study Programme: Chemical engineering

Course Unit Title: Industrial membrane processes

Course Unit Code: DSHPI02

Name of Lecturer(s): Assoc. Prof. Svetlana Popović, PhD

Type and Level of Studies: Doctoral Academic Studies

Course Status (compulsory/elective): Elective for Chemical-process Engineering

Semester (winter/summer): Winter/Summer

The language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): Face-to-face

Number of ECTS Allocated: 7

Prerequisites:

Course Aims:

The aim of the course is systematization and broadening of the knowledge related to membrane science and engineering. Various membrane processes and hybrid membrane processes are covered with course.

Learning Outcomes:

In this course, students gain skills to categorize and compare membrane processes, then to evaluate and choose appropriate membrane material, module, the process for the specific application in the industry.

Syllabus:

Theory

This course covers the following topics: membrane types, the theory of transport through membrane, types of membrane modules, membrane processes and application of membrane processes, separation properties of membranes, concentration polarization and fouling of membrane, microfiltration, reverse osmosis, nanofiltration, ultrafiltration, membrane membranes, application in medicine (hemodialysis, controlled delivery of drugs, artificial organs), membrane contactors

Practice

Student of doctoral studies has the assignment to search the newest scientific discoveries in the field of membrane processes and to present possible future improvements.

Required Reading:

1. Baker, R.W. Membrane Technology and Applications, John Wiley & Sons Ltd., Chichester, England, 2004.
2. Stratmann, H., Giorno, L., Drioli, E. An Introduction to Membrane Science and Technology, CNR-ITM at University of Calabria, 2006.
3. Scientific papers from highly rated scientific journals: Journal of Membrane Science, Separation and Purification Technologies, Chemical engineering Journal, Separation Science and Technology

Weekly Contact Hours: 6	**Lectures:** 4	**Practical work:** 2

Teaching Methods:

Lectures, and independent project assignment.

Knowledge Assessment (maximum of 100 points): 100

Pre-exam obligations	points	**Final exam**	points
Test I and Test II	-	oral exam	50
Seminar(s)	50		