Course Unit Descriptor

Study Programme: Food Engineering
Course Unit Title: Membrane separation processes in food industry
Course Unit Code: DPI1
Name of Lecturer(s): Zita Šereš
Type and Level of Studies: Doctoral Academic Studies
Course Status (compulsory/elective): Elective
Semester (winter/summer): Winter or summer
Language of instruction: English
Mode of course unit delivery (face-to-face/distance learning): Face-to-face
Number of ECTS Allocated: 10
Prerequisites: None
Course Aims: Acquiring knowledge of the most current membrane processes and devices that are in trial applications or accepted in food industries worldwide. Expanding the knowledge about membrane processes based on their scientific, economical and ecological principles and, through creative ways, accepting innovations and, therefore, encouraging personal involvement in improvement of existing processes and devices.
Learning Outcomes: Training students for the acceptance of the contemporary membrane procedures and devices that are used in food industries and evaluation of expediency of the most modern technologies, taking into consideration achieving favorable technological and economical effects, as well as positive outcomes for the environment.
Syllabus: *Theory*   Classification of membrane processes; Pressure difference led membrane separation processes; Polarization and membrane fouling; Pervaporation; Gas separation; Membrane contactors; Membrane bioseparation; Membrane emulsification; Application of membrane separation processes in various branches of food industry; Application of membrane separation processes in water treatments and environmental protection; Membrane crystallization; Membrane dehydration; Trends in membrane separation processes – economical analyses.   *Practice*   Laboratory work: use of semi-industrial plant for micro and ultrafiltration; separation of specific feed solution from food industry and their physical and chemical analyses; special analyses of several food products; calculation of membrane separation parameters based on experimental data; statistical analyses; interpretation of membrane separation results; process optimization; economical analyses.   Review: Presentation of the review in written form on the topic of the course, using clear, expert language with conclusions based on the correctly understood work aim.
Required Reading: 1. Šereš Z., Ultrafiltracija u industriji šećera, Zadužbina Andrejević, Beograd, Tehnološki fakultet Novi Sad, 2009,   2. Noble R.D., Stern S.A. (2003): Membrane separation technology, principles and application, Elsevier, Amsterdam,   3. Strathmann H., Giorno L., Drioli E. (2006): An introduction to membrane science and technology, Institute of Membrane Technology, CNR-ITM, Rende,   4. Šereš Z., Gyura J., Jokić A., Šoronja Simović D., Pajin B., Vatai Gy., Šaranović Z. (2010): Application of Nano-

and Ultrafiltration in Sugar Industry, Editor: P.T. Jenkins: The Sugar Industry and Cotton Crops, pp. 1-35, Nova Science Publishers, New York.			
Weekly Contact Hours:	**Lectures:** 4		**Practical work:** 2

Teaching Methods: Interactive lectures with application of the most contemporary computer software possibilities; Use of contemporary scientific and expert journals, publications, internet searches; Processing and selection of valid information about membrane separation processes in food industry and discussion about their applicability in industry.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Active class participation	20	written exam	/
Practical work	/	oral exam	40
Preliminary exam(s)	/		
Seminar(s)	40		

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.